



MODEL



48120

September 1988

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AIRPLANE

THE WORLD'S PREMIER MODELING MAGAZINE

**Kyosho
PLANET 40**

Canada \$3.75

**F-14 Tomcats over Canada!!
1988 QUINTE JET RALLY**

**DESERT DOINGS:
1/8 AF Fly-In**

**Top Flite's
Premier ARF...
HEADMASTER 40**

**NEW COLUMN!!
"Building Model
Airplanes"**

**Scratch-Builder's Dream—
SB2U-1 VINDICATOR
in 1/6-scale!!**

**3RD
PLACE
DESIGN
CONTEST**

**Cox All-Foam
PT-19 Small-
Scaler**



MODEL AIRPLANE NEWS



ON THE COVER: Representing two distinctly different but equally fascinating periods of naval aviation are the A-4 Skyhawk and the Chance Vought SB2U-1 Vindicator. The Fairchild PT-19 Cornell at the bottom was the first "hop" for many a World War II aviator. These three legends are captured in model form by Bob Relie with the Byron A-4, Doc Keith with his Vindicator, and Mike Lee with the Cox PT-19, all three part of this issue. Photos by Uravitch, Keith and Lee.

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Editorial

by RICH URAVITCH

A NUMBER OF YOU HAVE TAKEN us to task for some of the things we do, or, more accurately, don't do, within the pages of *Model Airplane News*. One of these concerns seems to be about the lack of "beginner" material. We're certain that we have the most informative, credible and visually pleasing publication in the R/C hobby field. We're also glad that there are "catalogs" out there for you to buy. Everyone, especially beginners, needs help with merchandise selection. I'm not convinced of the value of buying the same catalog every month; maybe four times a year to coincide with the four seasons? However, that gets a little complicated when the source of the catalog is, for example, in Southern California where, I've been told, there are no significant seasonal changes. What a dilemma—calling all over the country to find out what season it is, so you can decide when to change the catalog! This R/C hobby is so dynamic that for *MAN* to continue the growth it has always enjoyed, we must be prepared to recognize the needs of new enthusiasts.

Our growth spans almost 60 years, and that's more than the combined total of all the other R/C publications. We got here by paying attention to what readers ask for, and *doing* something about it. That's one of the reasons we're starting a new column in this issue; its title is simply, "Building Model Airplanes." Its author is widely recognized modeling expert, Joe Wagner, who alternates writing our "Small Steps" column with Randy Randolph and writes "About Those Engines" monthly. Joe plans to remind us of some facts we might have forgotten—many of which newcomers have yet to learn. We think it will be very popular, and we hope you'll enjoy it. After all, it was *your* suggestion.

- Keeping the wheels in motion, we're working on another theme issue downstream. This one will focus on trainers, and we hope to present readers who are new to all of this with some means of comparing a number of the available kits, radios and materials.
- Our "Reader's Reports" input, in which *you* evaluate products, continues to increase in popularity, and we'd like even greater participation. The rules are easy: Just send us a couple of photos and two or three paragraphs describing your findings about a particular kit or product. If we use your work concurrent with our full-blown "Field and Bench," your evaluation and pictures will be published, and you'll receive a free subscription. Here's a partial list of what we have in the works:

Ace 120-4 Bipe
Bob Violet Models Viper
Byron Originals Bullet
Byron Originals F-20
CGM Sophisticated Lady
CGM Vector ARF
Duracraft Duraplane II
Hobby Shack EZ "Dago Red" Mustang
Hobby Shack EZ Decathlon 25
Hobby Shack Loadstar
Kyosho Flash

Kyosho Cap 21 ARF
Midwest Aerostar 20
Polk's Modelcraft ARF Cub 25
Polk's Modelcraft Sharp 45
Sig Riser 100
Sig Spacewalker
UMD Challenger
Walt Moucha Models Charger MKII
Yellow Aircraft A-4 Skyhawk
Yellow Aircraft CAP 10

If you're working on anything listed here, remember some photos and a short story!

- Next month: Our annual Floatplane Issue (which will also include some amphibians!) featuring Clearlake '88, "Anatomy of a Floatplane," "Field and Bench" reports on Ace's Seamaster 40 and Hobby Shack's EZ Mermaid. Watch for it!

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Airwaves

Moving Up

I am 13 years old and have built several free-flight models that haven't been very successful. I've read quite a few books on R/C models and I'd like to move up to them. When I saw your review of the RPM Barnstormer 25L in the August '86 issue of *MAN*, I was pretty sure this was the plane for me. But since then, I've heard some bad reports about this plane. I've heard that after a few flights, it falls apart and, also, that the Barnstormer series has been discontinued. I don't know if this is true, so I thought you might know. I was wondering if this would be a good first-time model for a beginner.

PHILIP MORGAN
Advance, NC

Philip, unfortunately, the entire Barnstormer series, which was available from Hobby Shack, has been discontinued. My 25L "came apart" only after I flew it through a tree, but it sure never gave me any trouble that could be traced to design or material integrity. One of the reasons the plane flew so well was the turbulated airfoil, which "softens" the flying qualities and generally produces a more docile airplane. Some great trainers have come on the market recently, and we'll plan to cover them in our upcoming "trainer" issue.

CC

A Special Person

I'm considering doing a story about Harold Goldclank. Harold was a very funny guy and a social critic who saw the funny side of life, and was not afraid to lampoon the Establishment. He brought laughter and insight to our lives and, as such, should be remembered. He was what I call "The Clown Prince" of modeling, and stories of his antics are legion.

I'm looking for stories and legends by people who were touched by him. In addition, I need photographs; I don't have even one.

I've been in touch with Cliff Weirick, Dan Lutz, Phil Kraft and others, and

they suggested that I get in touch with *MAN*, as your files are supposed to have a number of photographs of Harold Goldclank, taken at a number of Nationals. The time line would be 1965 to mid-1980. I realize that I'm asking for the impossible, but if you can help me, it would be greatly appreciated.

NORMAN ROSENSTOCK
124 Granada St.,
Royal Palm Beach, FL 33411.

Norm, sounds like a great idea to me. I can remember visiting Goldy's home field in Brooklyn where he and other great R/C modelers formed the "S.O.B.s" (Sons of Brooklyn) R/C flying club. I can also remember him flying the entire pattern, except for T.O., and landing, inverted!! We'll search our files to see if we can help, and print your address for other modelers who can contribute their fond memories and photos.

RAU

Food for Thought

Model Airplane News caught my eye at a local grocery store. I picked it up and brought it home. Since then, I haven't put it down. I've read every article and almost all of the advertisements.

Is there someone I can write to for information on selecting the right engine and radio to go with the plane I'd purchase? Plus, I'd like a booklet of technical terms with definitions.

I've taken an aeronautics course in high school, so I know some of the basics, but I need as much help as possible, as I'm just a beginner. After reading your magazine, I'm very keen to start the hobby. Although I don't fully understand all the technical aspects of some of your articles, I feel that beginners, as well as professionals, can profit greatly from *MAN*.

BOB D. GRIMES
St. Joseph, MO

Bob, you didn't mention where in the grocery store you found us...gourmet

(Continued on page 10)

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We say that Sig CAs will be the modeler's choice because they have been developed from the very beginning with model airplane builders in mind! Developing products that suit the aeromodeler is one of the things we do best. That's because we are modelers ourselves! In fact, we have five National Champion modelers on our design staff and that wealth of modeling experience has helped us develop a CA adhesive system that has all the qualities you want. It hasn't been easy, Sig CAs have been in the "works" for quite a long time, over 3 years to be exact. That was 3 years of extensive testing and evaluating parameters like bond strength, workability, penetration, gap fill ability, tip clogging, odor, shelf life, and adaptability with different woods and other different modeling materials. The end result is a CA adhesive system that has some different characteristics that we know modelers will appreciate. After all, we have been in the business of producing quality model products for over 37 years. We are not about to let you down now. Drop in and check out the new Sig CAs at your local Sig Dealer. You will be glad you did. SIG MANUFACTURING CO., INC., 401-7 South Front, Montezuma, IA 50171

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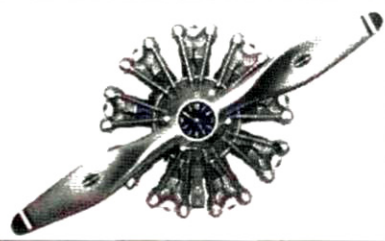
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Imitari has just introduced an exact ½-scale replica of the Pratt & Whitney Wasp Jr. engine with a clock placed in the space normally covered by the propeller cone. The Imitari clock, under authorization from United Technologies, also carries the official registered trademark decal of Pratt & Whitney.

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Airwaves

department, I suspect!! The best source for timely information is your local hobby shop dealer, who can probably direct you to the local club field, where you'll find most of the fliers willing to help you along. Talk to them and get their views. Also, digest some of our columns like Randy Randolph's "Basics of R/C" and "How-To," and Joe Wagner's "Building Model Airplanes." Good luck, and welcome.

RAU

On Holiday

I receive copies of *Model Airplane News* and would be very grateful for your help in obtaining addresses of model airplane clubs in or near Palm Harbor, Tampa, FL. We are visiting Florida during the first two weeks of October this year, and I should like to contact model clubs. Could you also advise me of the date of the Florida Air Show?

R. W. DALGETTY

90 Coldyhill Lane,
Newby,
Scarborough,
North Yorkshire YO12 6SD,
England

O.K. Floridians, how about a show of hospitality for Mr. Dalgetty? Drop him a card direct, and make him feel at home while he's on holiday in the colonies.

RAU

Timely Remarks

I've been flying a Navigator, a 6-foot seaplane built from plans put out by Timely Plans. It has been flying about 25 years, and I'm afraid its life is almost over. Can you tell me how to get in touch with these people?

RALPH DURBIN

1346 W. Lake Rd.
Conesus, NY 14435

Sorry, Ralph, it seems that *Timely Plans* has been out of business for a number of years, and we don't know of anyone who picked up the plans line. Maybe some of our readers can help? Incidentally, what size fuel tank is in your Navigator to keep it flying for 25 years? The best I can get is 25 minutes!!

RAU

Missing Plans

About 10 years ago, I bought a .10-powered Aeronca C-3 Hobby Shack kit. It had a 52-inch wingspan and was for 2 or 3 channels. While moving around the country, I never had time to build it. Now that I'm retired, I have the time, but I discovered that the plans are missing. I contacted Hobby Shack, but they advised me that the kit had been discontinued and no plans were available. Do you have the plans in your archives?

DON ERTEL

916 S. Gondola Dr.
Venice, FL 34293

Sorry Don, we vaguely remember the kit, but haven't been able to come up with plans. Reader help?

RAU

In Search of Dalotel...

Here's a real challenge for some of you dyed-in-the-wool airplane buffs. This is not as easy as it seems. We received a call from Jerry Cheney (Rt. 3, Bloomfield, IA 52537; phone 515-459-2212) asking if we had any photos of the full-scale Dalotel DM-165 with which he could document his already-completed model. Seemed like a simple enough request; "everyone" knew the airplane. Yeah, sure; try to find pictures! We turned up nothing, even after checking our usually "informed" sources. We featured the airplane as a construction article in our June '82 issue (plan No. 6822) and references are made to the designer, Michel Dalotel, and Societe Paulet. Hanno Prettnner wowed the world with his model at the TOC. You'd figure, with that kind of exposure, photos of the real machine would be easy to find! If anyone can help, let either us or Jerry know.

RAU

We welcome your comments, opinions and suggestions. Letters should be addressed to "Airwaves," *Model Airplane News*, 251 Danbury Rd., Wilton, CT 06897. Letters may be edited for clarity and length.

by LINTON "DOC" KEITH

A giant-scale, big-engine, scratch-built project that captures one of the most colorful periods of aviation.

Construction

FOR THOSE OF YOU who've been waiting for the third-place winner in our "Great R/C Design Contest," we're pleased to present "Doc" Keith's Chance Vought SB2U-1 Vindicator. As you read the article, we're sure you'll have the feeling, as we did, that Doc did a very thorough job on this magnificent model. What you see here is a proven design, having been through three iterations to incorporate refinements and improvements. Since this project was obviously a labor of love, we just couldn't convince ourselves to do the editing that's often necessary with many construction articles. As a result, we'll present this project in a slightly different fashion. Since the step-by-step building instructions are lengthy, we will provide them with the plans package. In addition to the two remaining full-size plan sheets, the package will include further construction photographs to supplement those shown here.



WAY BACK IN 1938, my grade-school teacher caught me building a model airplane in the back of the classroom and, after a reprimand, I was made to sit in the "naughty chair." Well, it's 50 years later and I'm obviously still naughty, because I still have the modeling bug. For me, scale is where it's at; building models of full-size airplanes turns me on, and seeing them fly is the frosting on the cake.

Early in my C/L days, it

S B 2 U - 1

VINDICATOR



VINDICATOR

became apparent, especially in R/C, that certain planes are modeled to death. I remember static-judging an R/C contest in which no fewer than six Top Flite* P47s were entered, all painted the same color and with identical markings. Having realized that there were other aircraft besides Mustangs, Thunderbolts, Zeros, Corsairs and J-3s, a new challenge became apparent. My new goal was to find scale subjects and model them before anyone else did, and believe me, it's

becoming increasingly difficult, because many others seem to feel the same way. In C/L I made it three times, producing a Fairchild C-119, a Shinn 2150A and an Avro Lancaster.

Doc has a big smile for obvious reasons; he's proud of his big Navy bird.



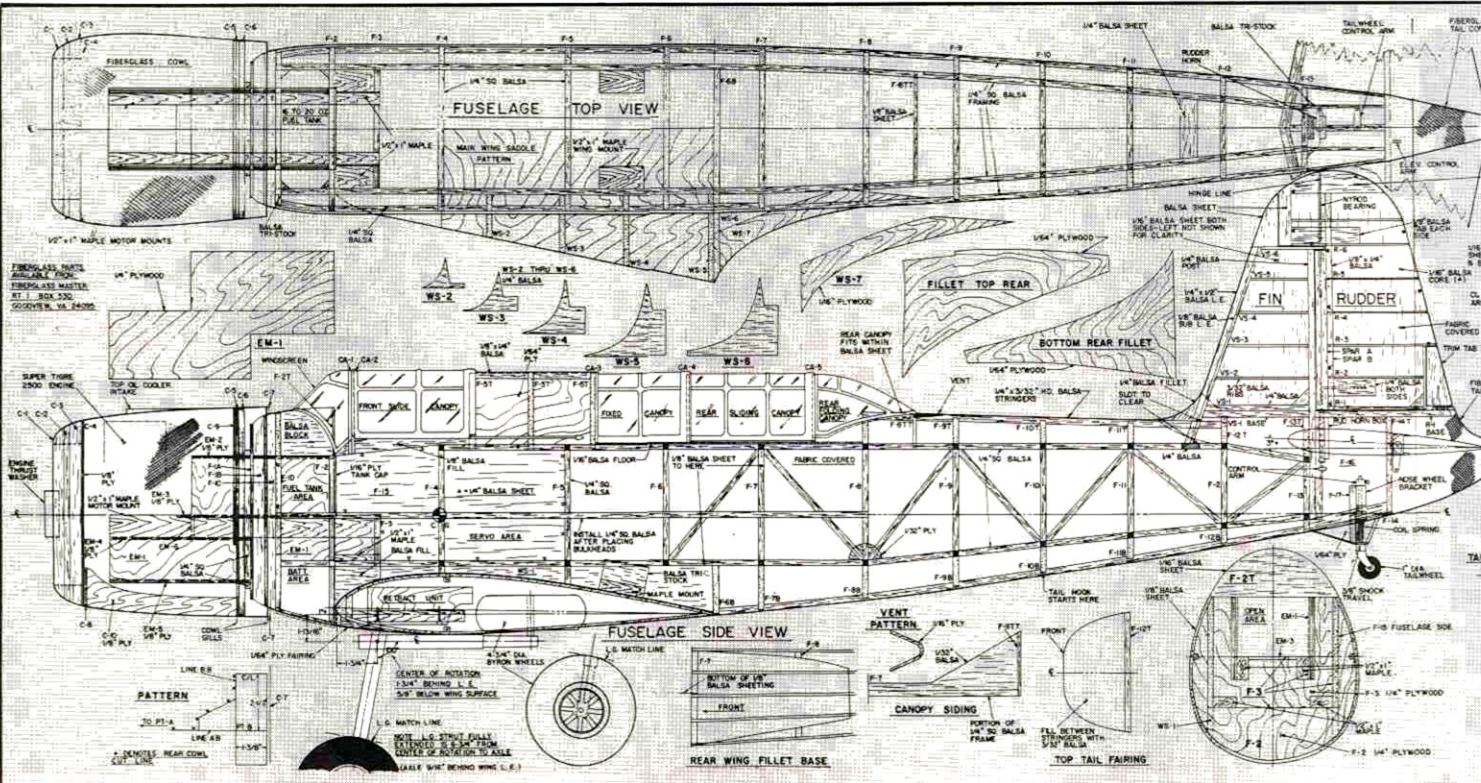
Looks like you can climb right in! Impeccably detailed cockpit, as well as sliding canopy, bombsight and rivets!

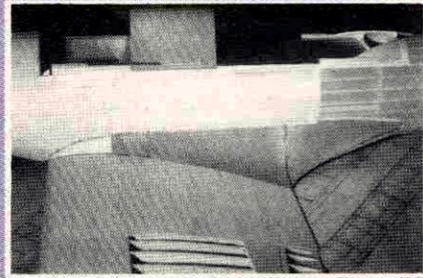
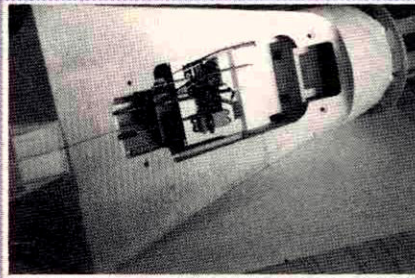
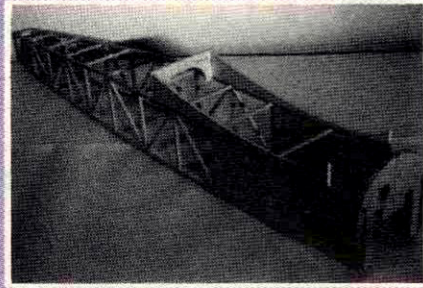


In R/C scale, it's become tough to pick a new scale subject and be the first kid on the block to build one. My first Northrop

A-17 flew in 1977, and a second one—a little larger than the first—flew in 1985 and is still going strong. Between those, I modeled a Miles M-20, which was beautiful, but unsuccessful,

FULL-SIZE PLANS AVAILABLE...PAGE 116.





During the early months of 1985, my latest brain child emerged. Having found a magazine write-up of the Chance Vought SB2U-1 Vindicator, the wheels in my mind began to turn. Research started, and material, pictures and information gradually accumulated. A letter to Chance Vought in Dallas, TX, brought a response that directed me to Arthur Schoeni, public relations supervisor during the era in which the Vindicators were being built. Through him, I contacted Boone Guyton, the chief test pilot for Vought, and others who furnished photos and even the Federal Standard 595A color numbers.

After many hours—and a plethora of profanities!—I finally calmed down and elected to use Wylam drawings, because they were definitely the most detailed.

Before building the Vindicator, I'd hoped to use an electrically operated gear. This presented a problem, because the SB2U-1 has an externally pivoting, 90-degree rotational gear. This means that its center of rotation is outside the wing

(Continued on page 17)

SHEET 1 OF 5

MODEL AIRPLANE NEWS

CHANCE VOUGHT "VINDICATOR"

SB2U-1

DRAWN BY DOC KEITH

TRACING BY JOE DEMARCO

ALL RIGHTS RESERVED

Above: Cowling oil-cooler intake becomes functional by removing material under scoop.

VINDICATOR

SPECIFICATIONS

Type: Giant scale
Span: 84 inches
Weight: 21-26 pounds
Wing Dihedral: 7 degrees
Wing Area: Approximately 1,220 square inches
Scale: 1/6 (2 inches = 1 foot)
Horizontal Stab Incidence: +3 degrees
Power: Super Tigre 3000
Propeller: Zinger 18x8
Fuel Capacity: Two 10-ounce tanks
Fuel Consumption: 1 ounce +/minute
Landing Gear: Electrical 90-degree rotating; Cycle time: 8 seconds up; 8 seconds down
Radio Used: Futaba FGK, 7-channel; Control functions: aileron, elevator, rudder, throttle, landing gear, flaps, tank drop and tail hook
Mechanical Features: 40-degree flaps; retracting, rotating landing gear; shock-absorbing main struts; gear folds into wing in exact scale position (no significant trim change); sliding canopy; working arresting hook; shock-absorbing, steerable, tail-wheel assembly; scale functioning exhaust outlets; authentic FS 595a colors and markings; auxiliary fuel tank (can be jettisoned)

Materials Used:

Fuselage: Balsa, sitka spruce, plywood, polyester resin and fiberglass tail cone, cowling and air scoops

Wing: Balsa, spruce, ply, carbon fiber

Empennage: Balsa, spruce

Plans: Created by enlarging Wylam drawings using a 1000W opaque projector.

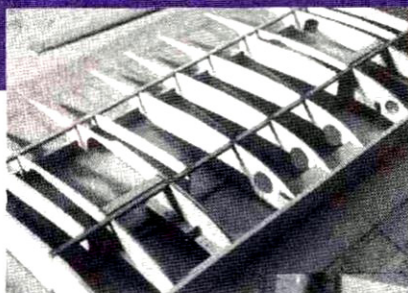
Major interior cockpit detail includes instrument panels, bucket seats, headrest, major radio and electronic gear, rear .30-caliber machine gun, oxygen tanks, control sticks, rudder pedals, and two 1/6-scale Navy pilots.

Exterior detailing includes raised paneling, rivet detail in all major hatches, antenna mast and rigging, Pitot-tube wing-tip lights, sliding canopies, scale hinging, trim tabs and actuators, authentic textured wing walks, bomb racks and auxiliary fuel-tank mount.

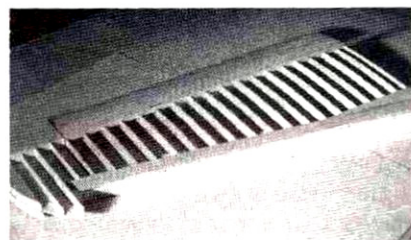
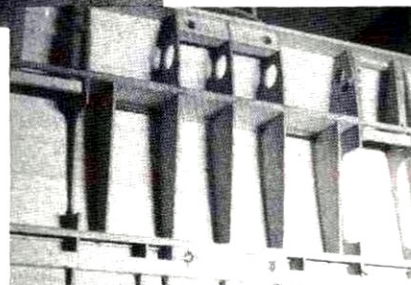
Finishing: All control surfaces, the aft portion of the fuselage and the outer wing panels are fabric-covered with World Tex. The aircraft was primed and spray-painted with DuPont acrylic lacquers, professionally matched to Federal Standard color chips.

Color and Markings of Model:

- 1. USS Saratoga: white tail
- 2. 5th Section leader: Willow Green cowling and fuselage band
- No. 13 was constant for all Section-5 leaders
- Nos. 14 and 15 were the other two aircraft in Section 5
- Only the Section leader had a colored fuselage band



Above: Wing center-section before sheeting.
 Right: Note recesses for retract, pushrod passages and hardwood hold-downs.



Right: Left-hand outer wing panel with tip not yet shaped. Note inboard triangular T.E. sheeting that butts up to main T.E. sheeting. Rib placement is scale.

ORDER THE FULL-SIZE PLANS

Chance Vought SB2U-1

#9881GS

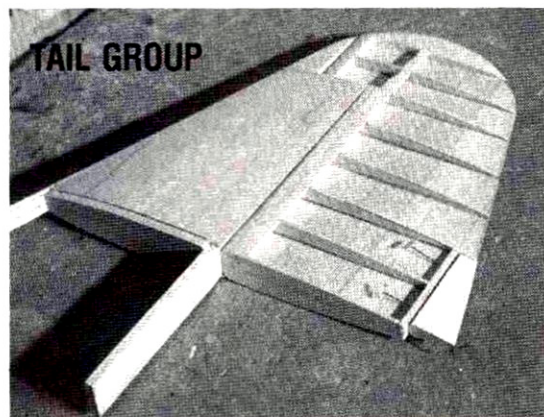
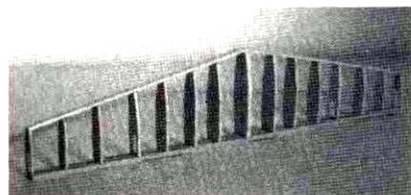
Vindicator

\$25.00

This pre-World War II Navy classic, by Doc Keith, is designed to 1/6 scale, giving it a wingspan of 84 inches. A large model by any standard, it represents the last of three levels of refinement to the basic design. Although not recommended for beginners because of its size and relative complexity, conventional construction techniques and materials are employed, so it can be built by a modeler with reasonable skills and experience. All-up, ready-to-fly weight is in the 25-pound range. Three highly detailed sheets.

Right: Rib, T.E. and L.E. to basic stab assembly.

Below: Finished vertical stab and rudder. Again, scale rib placement and trim tab add a lot.





SPECIFICATIONS

Gross Weight: 6,323 pounds

Empty Weight: 4,676 pounds

Speed in Clean Condition: 231mph at sea level; 250mph at 9,500 feet.

Fuel Tank Capacity: 50 gallons

FIFTY-FOUR SB2U-1s were originally contracted by the US Navy on October 26, 1936, and 241 were eventually produced. Twenty went to France as the "V-156" and 50 to Britain as the "Chesapeake."

Deliveries to the Navy began on December 20, 1937, when four aircraft were taken on charge by Bombing Squadron (VB)-3—the "High Hats" assigned to the Saratoga. A squadron consisted of 18 aircraft and was divided into six "sections," each having three aircraft and its own color.

The SB2U-1 could haul a 1,000-pound bomb and two 100-pound bombs (one under each wing) for 635 miles, and it had a 50-gallon auxiliary tank that could be jettisoned. Rear defense was provided by a single .30-caliber machine gun.

The taper of the canopy sides resulted in very confined cockpit quarters, so pilots usually preferred to leave the canopy open.

surface, and when the gear-leg retracts, it remains outside the wing contour. My attempt to find a source for such a gear was a disaster! After more than six months, I eventually received a set that didn't hold up for three good flights. From Aero Marine Enterprises, they were ultimately trashed—\$200 down the drain!

I opted for fixed gear. With that, it flew in one contest in Giant Scale Class, had the highest static score and flying score and won *first* place. However, the ninth flight back at home base was a different story. It was soon evident that any airplane will quit flying in a stall position with a dead engine if the glide path is too long. A tip-stall from 50 feet and a

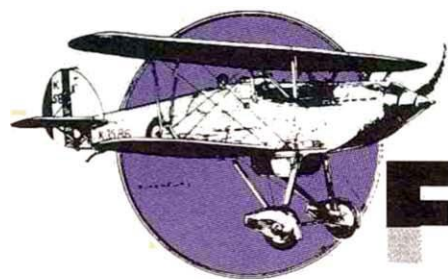
"...electrically operated gear... presented a problem..."

straight-down plummet doesn't leave much to salvage! Vindicator No. 1 weighed about 24 pounds with full front and rear cockpit detailing and a 12-ounce pilot, à la Dave Platt*. (Dave has always been one of my idols in scale building.)

After picking up the pieces of No. 1, it was back to the drawing board. Many scale modelers would have moved on to another project, but there were many reasons why I opted for Vindicator No. 2. Two of these reasons were my good friends Stan Moran and Larry Routh. Stan is an outstanding design engineer in the Fresno, CA, area, and Larry was my test pilot. Stan offered to design and build a set of electrical rotating retracts, if I agreed to build No. 2.

Within a week, Vindicator No. 2 was in the construction stage. Salvaged from No. 1 were interior details, some canopies, outer wing panels and other miscellaneous items—not much, but something. Seven months later, No. 2 was ready, and so was the most beautiful set of electrically operated gears you've ever seen. One small electric motor (9.6V with a gearbox) turns two drive shafts with universal joints. These lead to

(Continued on page 43)



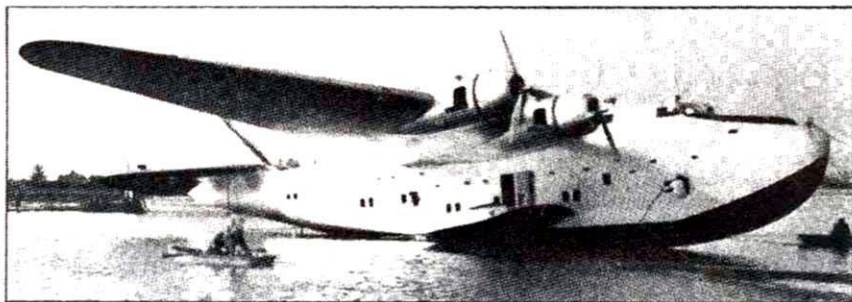
by STEVE POND



THERE WERE MORE THAN 60 new commercial aircraft waiting for approval from the Bureau of Air Commerce, and more than twice that number of military aircraft were on the drawing boards or in the prototype stage in September '38. To say the least, this period was very active for aircraft suppliers. Manufacturers not only had to keep up a blistering pace to fill domestic orders for the new breed of transports, but they were also confronted



The late Carl Goldberg, of Carl Goldberg Models, Inc., with his trophies from the 1938 National Model Airplane Contest.



America's mightiest flying clipper of the time, the 74-passenger Boeing 314, was built for Pan-American Airways. When fully loaded, it weighed 41 tons!

with an increasing number of orders from overseas. Lockheed was shipping aircraft to Poland, Czechoslovakia and Rumania; Douglas was shipping the new DC-3 to Japan and Switzerland; some of the new twin-engine Grumman amphibians were destined for Australia—the list goes on.

Boeing had delivered what was considered to be America's mightiest flying clipper to Pan-American Airways in the hope of grabbing the contract for a trans-Atlantic aircraft. This mighty clipper carried 74 passengers and weighed more than 41 tons when fully loaded. Another sizeable flying boat—the Sunderland—was being constructed by Short, of England, for use as a bomber for Britain's Royal Air Force. Another military aircraft—the Brewster XF2A-1—was on its way to the US Navy and was considered to be the most deadly of Navy aircraft. The prototype Curtiss P-40 Warhawk was nearing completion and was slated to make its test flight the following month.

The modeling world was also making rapid progress. If there wasn't some news about the development of a radio-control system, there was an onslaught of new scale rubber- or gas-powered planes trying to keep pace with the changes in full-scale aviation.

The 11th Annual National Model Airplane Championship Contest was featured in the September '38 issue of *Model Airplane News*. Walter Good took home the MAN Award for his radio-control airplane that had an 8-foot wingspan and weighed only 7½ pounds complete with



Walter Good and radio operator Paul Kreelick also went home from the 1938 National Model Airplane Contest with a trophy for their radio-control airplane.



The most popular transport of the time, the Douglas DC-3, is shown here being prepared for transport to Swissair Airlines, Switzerland.

radio system. Another name that surfaced as a winner during the Nationals was that of Carl Goldberg. His name could be seen gracing the pages of *MAN* as a byline on his informative "How-to" articles and, in the September issue, as winner of the Springfield and Flying Aces trophies during the Nats. As most of you know, Carl later went on to form his own company (Carl Goldberg Models), manufacturing model airplane kits and accessories.

Next month: a historic flight around the world! ■

**KYOSHO'S NEW ARF
PROVIDES
"OUT-OF-THIS-WORLD"
PERFORMANCE!**

by RON FARKAS

WE ALL KNOW about the constantly improving selection and quality of almost-ready-to-fly (ARF) airplanes. Construction runs the gamut from all-molded plastic parts to a combination plastic skin-over-wood structure to completely built-up wooden airframes. The Planet 40 is one of this latter group. It's manufactured in Japan by Kyosho and distributed here by Great Planes Model Distributor*. This model

KYOSHO



PLANET

40 ARF

using jigs and fixtures for accurate alignment and to speed operations. Completed sub-assemblies (wings, fuselage and tail) are then covered with an adhesive plastic film that already has the color and design applied to it. The parts are then packaged, along with a comprehensive assortment of accessories, and shipped to the good old U.S.A. for final assembly in *your*

workshop. Standardization, mass production and low labor rates keep the kit price attractively low. You can find the Planet 40 listed in the Tower Hobbies* catalog at \$124.99, and that's with 90 percent of the work already done.

THE KIT: Here's what you'll find in the box: There are a pair of wing halves with the ailerons temporarily hinged and the torque rods installed, a completed fuselage with motor mount installed, and both horizontal and vertical tail components with control surfaces temporarily hinged. These parts are completely covered and ready to assemble, although in some places,



Photos by Rich Uravitch.

is for sport and pattern flying, and it's a good choice for intermediate to advanced pilots.

With modelers' increased acceptance of ARFs, Kyosho has now directed its efforts toward the flier who feels more comfortable with a built-up balsa-and-ply model. One advantage of this type of model is that it can be repaired using conventional materials. (This will be discussed a little later in the review.)

It appears that models of this sort are hand-built on assembly lines, probably



Ron poses for camera just before maiden flight; you never know!

PLANET



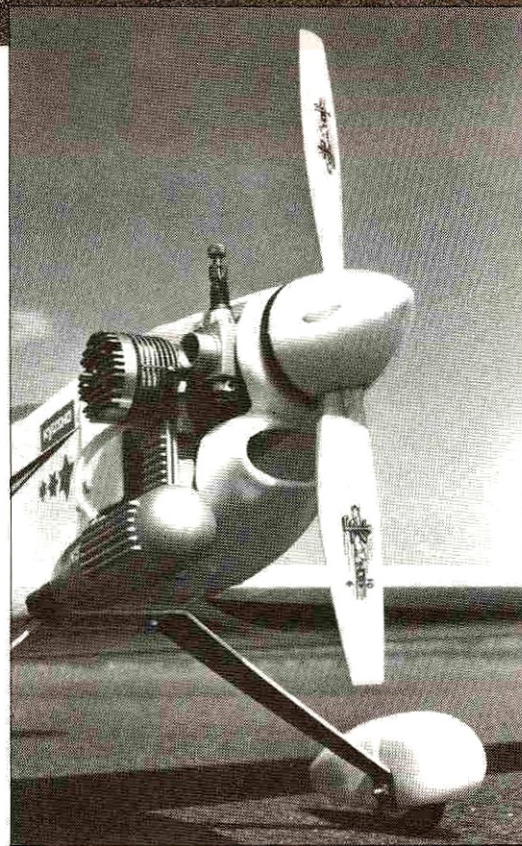
the covering on my kit was rather loose and wrinkled. There are also light, plywood, dihedral braces and servo trays. The accessories include a molded-plastic tail fairing, a canopy, a cowl, wheel pants, a dural main gear, tail-wheel wire, wheels, a fuel tank, a spinner and nuts and bolts. There are no plans but, for an ARF kit, the illustrated instruction booklet is surprisingly good.

ASSEMBLY: Since so much of the work is already done, I expected the final assembly to be a piece of cake. Well, my actual "hands-on" time only added up to about ten hours, and that sounds pretty good. However, I probably spent another five hours head-scratching, due to some trial-and-error work along the way.

I must compliment Kyosho on the instruction booklet. That's right, I said *booklet*. Some ARFs have only one page of badly translated instructions and sketches that look like doodles. The 11-page Planet booklet has about six photos on each page and a paragraph of instructions with each photo. I did find a couple of bloopers in the text, but these wouldn't confuse a builder with a little experience. Actually, my kit contained *two* sets of instructions; the second booklet had the same pictures, but the text was somewhat less lucid.

Let's start at the beginning. Before installation, I sealed all the exposed ends of the control surfaces with CA. The first step in the assembly is the permanent installation of the ailerons using the provided hinges. The hinges are of the "live" polypropylene plastic variety, and they're very stiff. Even though the instructions don't say so, the hinges should be broken-in by flexing several times before being glued into position. Also, to get enough aileron travel, the slots where the torque rods exit the top of the wing should be opened up with a modeling knife.

Next, I joined the wing panels, along with the dihedral



Under-scoop really adds to the sleek appearance of the Planet 40.

braces. The center-section alignment was very good. Using the die-cut light plywood parts, the wing was completed by installing the servo tray.

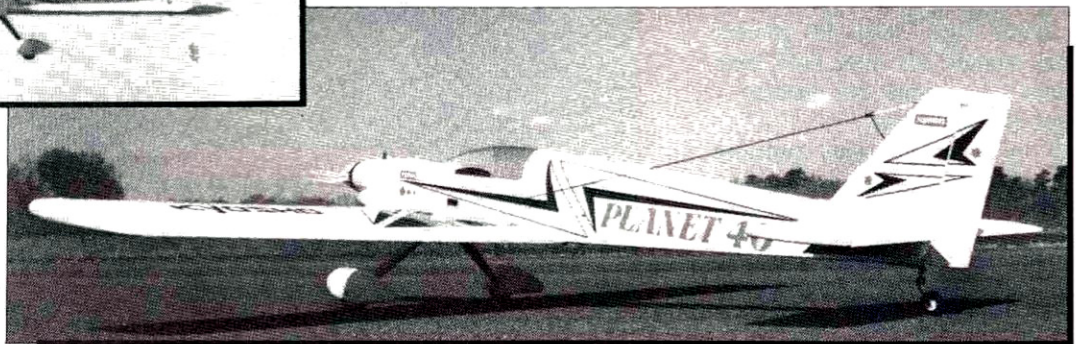
Before installing the horizontal stabilizer, the elevators

should be hinged. I had to deepen all of the hinge slots to get nice, tight, control-surface gaps. I then glued the stab onto the fuselage, followed by the vertical fin and a molded-plastic fairing. I aligned the tail surfaces without any trimming of the stab saddle.

The next few sections of the instructions dealt with the installation of the wheels and the wheel pants and the mounting of the formed-aluminum main-gear legs. I couldn't mount the pants with the supplied screws, so I



Whether in the air or on the runway, the Planet's lines are very pleasing. Slow fly-bys were very easy with sport/pattern airfoil.



substituted longer ones. The blow-molded plastic pants were easy to trim and held their shape very well. The main gear was screwed into the light plywood fuselage bottom with two sheet-metal screws, and the steerable tail-wheel bracket was also secured with its screws.

Installing the O.S.* .40 FSR engine was easy, since all I had to do was clamp it to the cast-aluminum mount with the two metal straps that go over the lugs. For added

security, I used blue Loctite* 242 on the screw threads. Like the wheel pants, with a hobby knife, the cowl was easily cut out to clear the engine and muffler.

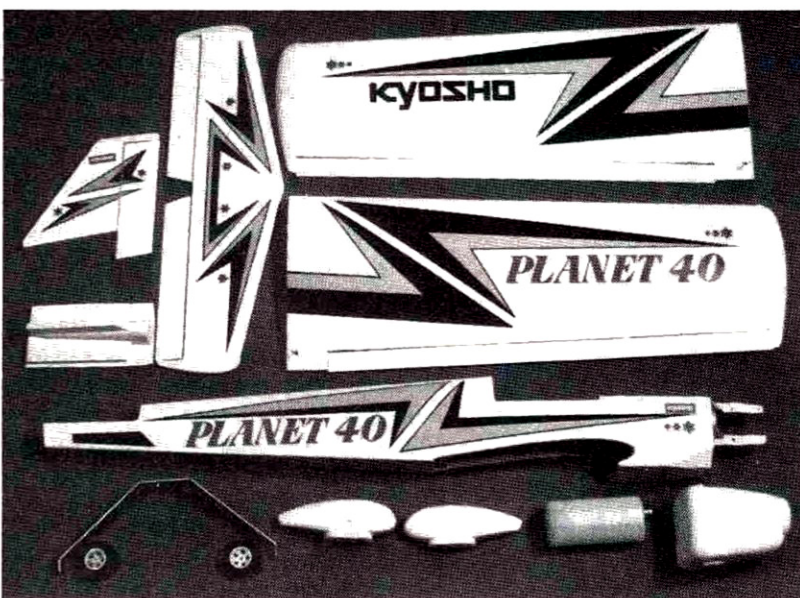
Next, I installed the fuel tank, the radio and the pushrods, encountering a host of minor, but annoying, problems. For example, there are no instructions for plumbing the tank, but that's easy if you've done it before. The tank didn't slip into the fuselage until I'd shaved a

little off the main former for clearance. Also, the wing wouldn't fit until I'd first relieved the hold-down block for the aileron torque rods.

Now to the matter of the Y-configuration elevator pushrod. As many of you have already discovered, you can't "fish" the forked end down through the fuselage and out through the exits at the tail. According to the instructions, "This may take a little time, but it is possible." I think customers deserve a much better explanation. Over time, I've learned that you can feed a couple of long pieces of nylon tube up from the tail to the radio compartment, then screw them onto the threaded pushrod ends and draw the pushrod back until the two wires come through the exit holes.

Just by looking at the radio layout, I could see that this plane would come out tail-heavy. On the suggested layout, the

(Continued on page 44)



Planet 40 sub-assemblies and components right out of the box.

SPECIFICATIONS

Type: Sport-Pattern ARF

Span: 59 inches

Weight: 5½ pounds

Area: 580 square inches

Wing Loading: 21.8 ounces per square foot

Power Req'd: .40-.45 2-stroke; .60 4-stroke

No. of Channels Req'd: Four

Suggested Retail: \$164.95

Features: Pre-built balsa and light plywood airframe, covered with finished plastic film. Plastic cowl, wheel pants, fuel tank and wheels included.

Introducing

Building Model Airplanes

by JOE WAGNER

TOO MANY PEOPLE regard the construction of model airplanes as an unpleasant chore. Ads for "Almost Ready To Fly" (ARF) R/C models say things like, "The hard work is already done!" and, "Over 90 percent completed straight out of the box!" and, "Now that we've done the building—you've got the time to fly."

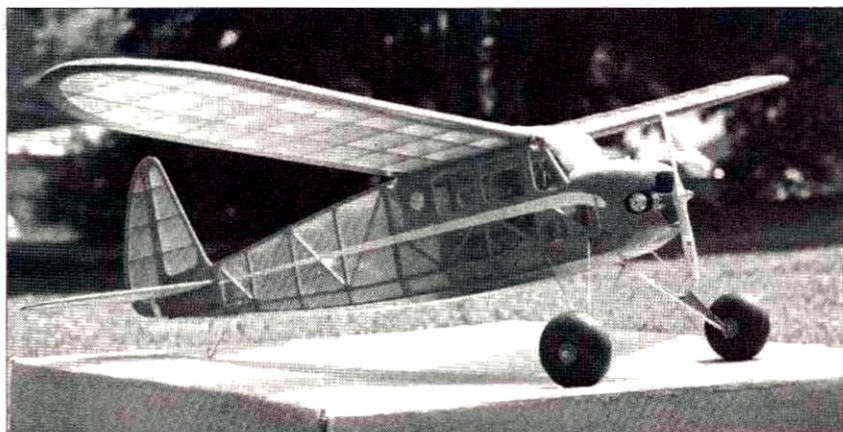
But if you're familiar with modeling techniques, the construction of miniature aircraft can be very enjoyable. It lets us use creativity and manual skills to personalize our models—whether they're from kits, magazine plans, or our original designs. Models that are properly hand-built are lighter, stronger, and fly better than any factory product. In general, they're less expensive to build and to repair.

There are only a few types of ARF planes, but there are unlimited choices when you build your own model. Literally hundreds of kits are available, from tiny 1/2As to gigantic quarter-scalers. Thousands of inexpensive plans can be obtained from model magazines and plans suppliers. As for original designs, there are no limits.

ARF fliers might say that they don't have the time, the space, or the equipment to build their own models. It may *seem* that way, but let's take a look at each of these objections.

- **Time:** ARF advertisers imply that time spent building is time lost from flying. That isn't so, because models can be constructed at night, or during bad weather. If you take advantage of even small amounts of spare time, the results will add up, and the project will soon be completed. Yes, model building is time-consuming, but it's not time-wasting.

- **Space:** If you have available space to assemble an ARF, then you have enough space to build your own models. Sure, it's nice to have a large workshop, but it's not necessary. A friend of mine constructed an airplane in his walk-in closet. It had a 6-foot span and a 4-foot fuselage! Doug



An all-built-up airplane, like this 1938 Cleveland Cloudster, is an art form in itself, but not difficult to make if you know modeling techniques.

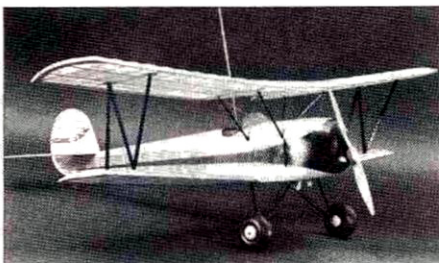
Spreng, the co-inventor of digital proportional R/C and a champion aerobatic flier, built many of his early models in the tiny bedroom of a trailer home. Ingenuity can overcome many obstacles!

- **Equipment:** You can scratch-build models with just a few more tools than are required to assemble an ARF. You don't need to own a workshop full of

power tools. I got by for years with only a Dremel scroll saw and a 1/4-inch drill motor. An unfinished luan-plywood flush door makes an excellent building board. You might be able to find one with a slight defect at a reduced price. Put the door on top of a card table, and you'll have a workbench that can be easily disassembled when the building session is over.

So the usual excuses for not building R/C models won't stand up to close scrutiny. However, there are a couple of valid reasons why many people avoid doing their own model building: They don't feel that they're sufficiently competent and they don't like the drudgery that they *think* building entails. I hope this column will provide newcomers and established modelers with a different perspective. The tricks and techniques that I've learned in my 53 years of active model-making include ways to simplify boring tasks (like cutting out the ribs for a 9-foot wing) and easier construction methods. I'll also describe new modeling tools that will improve accuracy and minimize time, trouble, and expense.

This column is also meant to serve as a model-builder's forum. I'll answer questions, exchange techniques and ideas, and do all I can to help you build R/C airplanes. Please send me your questions and suggestions. (If you want a personal reply, please include an SASE.)



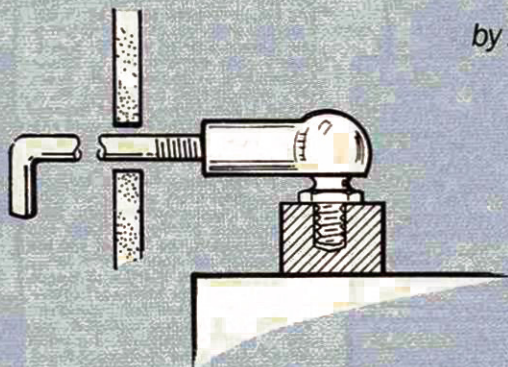
No ARF can match a light, hand-built model, such as this little Cox .020-powered Wiley Post biplane.



Prefab kit models are fun to modify so they resemble scale models. This Taylorcraft 0-59 look-alike began as an Ace Air Scout.

Hints & Kinks

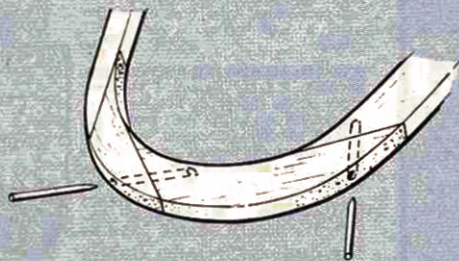
by JIM NEWMAN



SWITCH ACTUATOR

This is yet another application for that useful ball-and-socket joint. Drill a suitable hole in the top of the on/off switch, and use CA glue to hold the ball in place. Snap the socket over the top and take the threaded rod out through the fuselage side, where it can be disguised as a door handle or venturi.

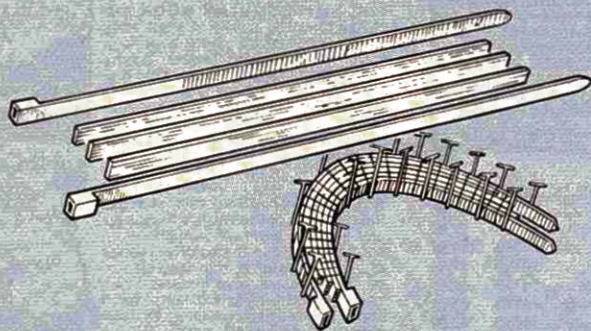
Bill Lehn, Dayton, OH



PEGGING JOINTS

An old shipwright's trick: If wing or tail tips are built of balsa segments, drill through them as shown, then insert glue-coated toothpicks and sand them flush. On smaller models, you can use bamboo pegs stripped from window shades or chopsticks.

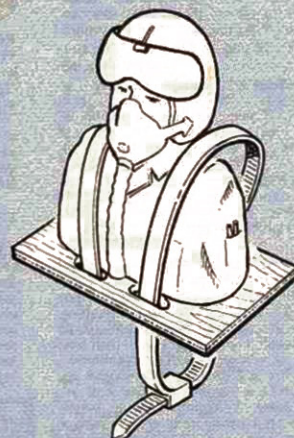
Bob Hughley, Twisp, WA



LAMINATED OUTLINES

Place a nylon cable tie on both sides of a pack of wet, glue-coated balsa strips and wrap the bundle with nylon thread. Pull the bundle into the desired curve and pin to shape on the work board. When dry, the thread can be cut and the ties easily separated.

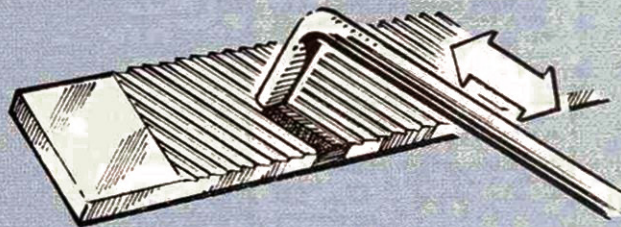
Robert Peterson, Youngstown, NY



PILOT MOUNTING

Here's an unusual, but logical, method of attaching your pilot figure. Cut slots in the mounting platform and tightly loop nylon cable ties up through and over the pilot's shoulders. In place, the white ties look like regular seat harnesses, but if you don't like the color, dip them in fabric dye, or buy black or gray ties. (Try Radio Shack.)

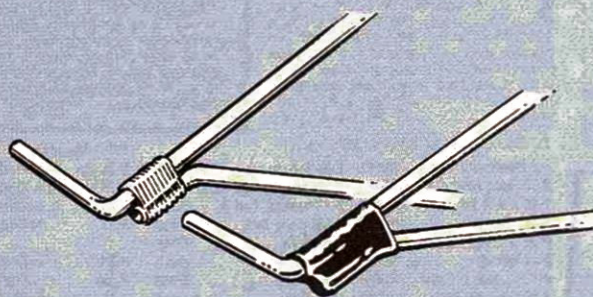
Richard Trost, Banks, OR



FILE CLEANING

With use, files become clogged with particles, particularly when used on aluminum. Take a piece of copper tube or rod and beat the end until it's flat. Then bend it 90 degrees, as shown. Rake this tool back and forth across the file to remove particles from the teeth. Before using a file on soft metals, rub a stick of chalk across the teeth to help prevent clogging.

Gene Chase, Oshkosh, WI

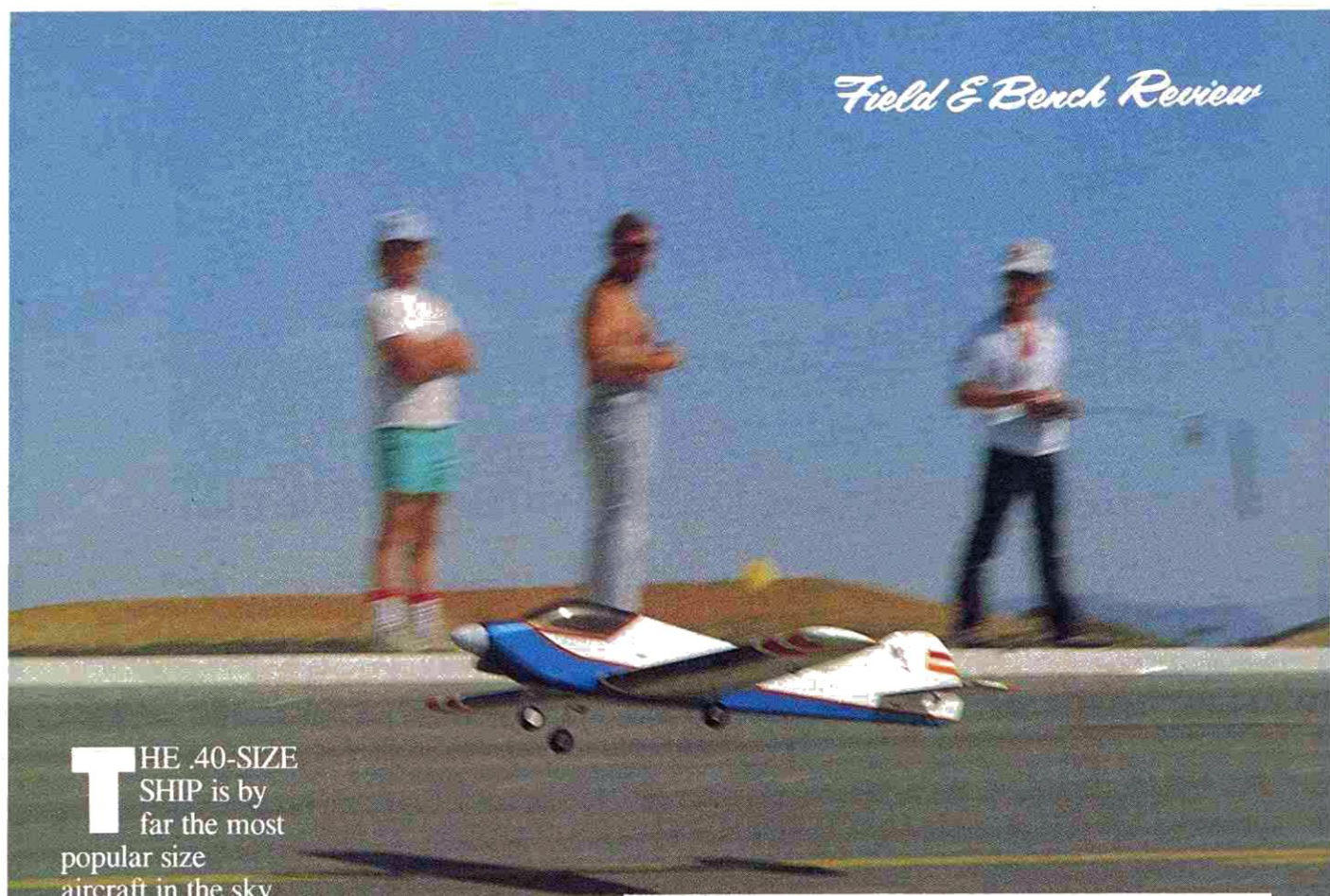


TIDY SOLDER JOINTS

After binding and soldering, slip a piece of heat-shrink tube over the finished joint. Depending on how the wires are assembled, you might have to put the tube on before soldering.

Jim Kummerow, Lagrange Park, IL

Model Airplane News will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Hints & Kinks." Send rough sketch to Jim Newman, c/o Model Airplane News, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO, AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.



THE .40-SIZE SHIP is by far the most

popular size aircraft in the sky.

Just take a look at the shelves in your hobby shop! However, finding a *mid-size*, sporty, good-looking hot-rod that can burn the sky as the big ships do, isn't easy—until now! GM Precision Products'* Rainbow Runner 45 is just that kind of ship. Although named for a 45-size engine, it's common knowledge that most 45s owe their casings to their smaller 40-size cousins. This means that you can benefit from the additional



Airborne or static, the Runner is an attractive, practical-size, sport/pattern ship. Nice color scheme sharpens look.

GM PRECISION

RAINBOW

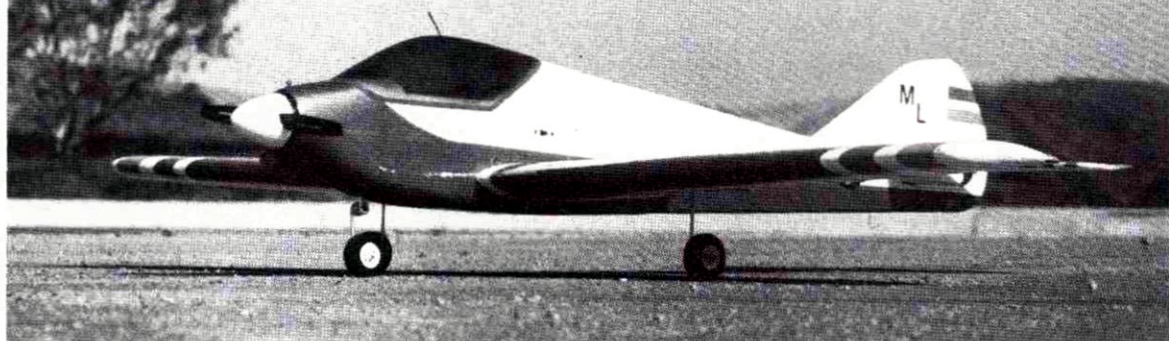
45

Runner

Sporty, good looking hot rod can burn sky like the big ships!

by MIKE LEE

*Low-angle shot
discloses that
wing location is
more mid-placed
than low. Clean
lines are evident.*



SPECIFICATIONS

Type: Sport Pattern

Span: 59 inches

Weight: 4½ pounds

Area: 575 square inches

Power req'd: .40-.45 2-stroke

No. of channels req'd: Four

Suggested retail: \$109.95

Features: All-balsa, built-up construction; very complete hardware package; machine-cut parts.

power of the 45, but it has the same physical dimensions as the 40.

The Rainbow Runner 45 is billed as a pattern performance-level aircraft. Indeed, it has all the features a modern pattern bird should be endowed with to fly an effective pattern. It has lots of wing area (575 square inches), and this is coupled to a fairly long tail moment (17 inches T.E. wing to L.E. stab) with plenty of lateral area on the fuselage. This adds up to an aircraft that should fly well on the wing, be smooth on the pitch-and-roll response, and be able to knife-edge easily. We'll see how it fares.

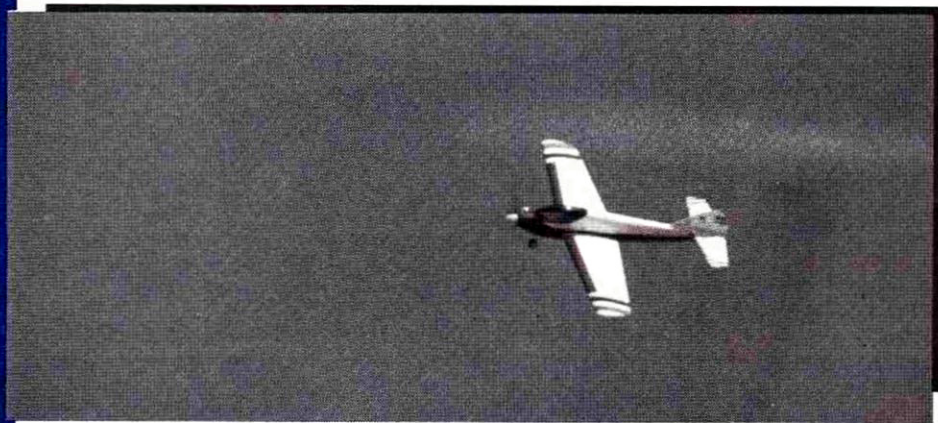
The Rainbow Runner starts its life as a box of cut-out balsa, ply and hardware. As this is the second GM Precision model I've built, I can confidently say that this company knows how to make kits. All parts are machine cut—no die-cutting. The cuts are very sharp, and the cutting accuracy is as close as it's possible to get. Standard building tools are the only ones needed for this assembly.

CONSTRUCTION: This phase starts with the sheet-balsa tail feathers.

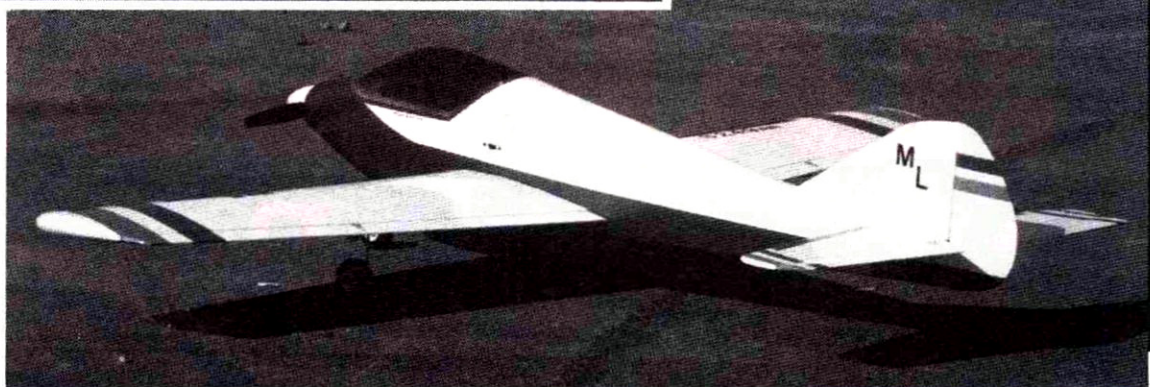
These are made from several parts to provide maximum strength and good surfaces with which to finish the edges. There's really nothing to do but match and glue. For gluing virtually all construction joints, I chose Satellite City* Hot Stuff Super "T," because it's very effective.

The fuselage has full-length light-ply sides (reinforced with

(Continued on page 61)



Above: P³ (Perfect Pattern Proportions). Long tail moment helps tracking, as does generous fin area. Right: Aft ¾-view shows wing taper, washout and dihedral; all stability builders.





Jet Blast

by RICH URAVITCH

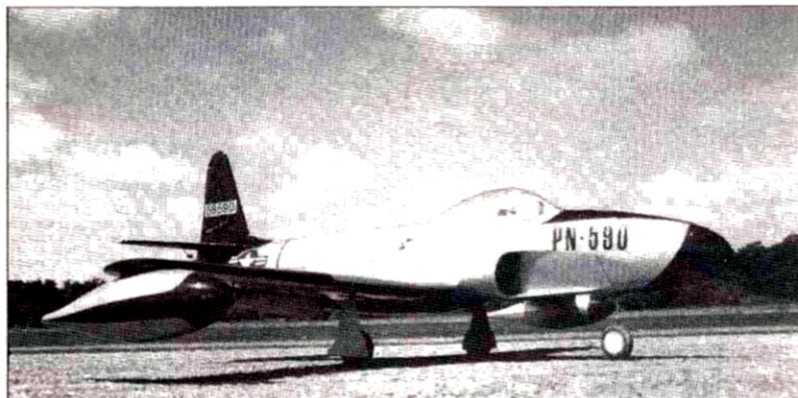
FOR THOSE OF YOU who can't seem to get enough fans, I decided to augment this month's Canadian Fan Fly coverage with our regular "Jet Blast" column. There's a lot happening, including the return of a couple of old favorites, the first flight of a sure-fire success, some organizational changes from a leading supplier, new fan fuel from one of the biggest names in fans, new kits, experimental designs, plus lots more.

F-80 and T-33

Starting things off, many of you will be pleased to know that the excellent flying F-80 and T-33, designed by Kerry Sterner and kitted by his company, Sterner Engineering, will be available again. Kerry has decided to explore new, non-modeling-related horizons and has sold all the rights to his designs, along with all the molds and tooling, to Nick Zirola Jr.* Nick is now flying one of the F-80s, with an eye to further refining the design to include provisions for better equipment access and an integral inlet system to permit the use of the Dynamax fan unit. The original Byrojet-powered version may still be offered. Also part of the acquisition were the Fan Trainer, the A-7 Corsair II and the Sportique Biplane. I'm glad to see that such fine fliers won't slip into oblivion but will, in fact, probably re-emerge as even better products.

Bob Violett Models

The production version of the long-awaited Bob Violett Models* F-86 Sabre has flown, and flown well, I understand. Kits should be in the hands of patient purchasers by the time you read this. If you haven't had the opportunity to examine one of Bob's kits, do yourself a favor and cast an eyeball on one. The glasswork is of an extremely high quality, but the overall attention to detail is where they really shine. I've heard modelers comment that the price seems a little high, but, as the expression goes, you get

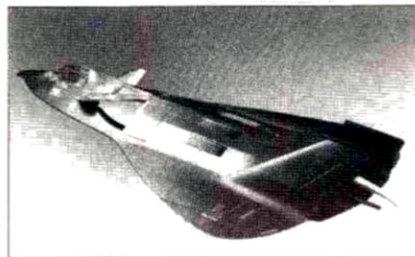


Return of the Shooting Star!! The Sterner line of ducted-fan kits, including this F-80, has been acquired by Nick Zirola Models. They will be re-introduced. Model by Jim Howard of Texas.

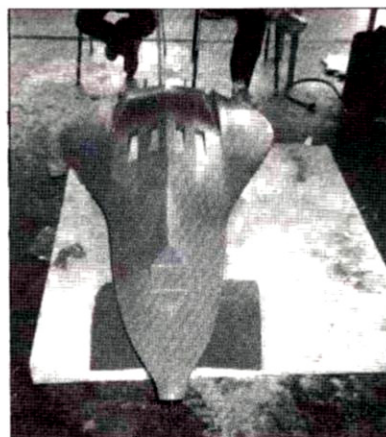
what you pay for. That may seem somewhat trite, but you'll probably discover that these kits represent a "no-compromise" product. The Violett team has also developed an expanding line of accessories, some of them jet-unique, others with general applications. These are injection-molded items, like gear-door linkages, hatch latches and some of the neatest-looking servo mounts to come down the pike. Also in the works: a really effective tuned-pipe system that really quiets things without significant power loss. For you "no-compromise" people who won't stand for *any* power loss, the KBV .72 has been punched out to an .80. If you need more than that, order your F-404 from G.E.

New Venture

At the recent Bay of Quinte Canadian Fan Jet Rally (covered elsewhere in this issue) I noticed a lot of Yellow Aircraft* A-4 Skyhawks. I also noticed a lot of Yellow Aircraft T-Shirts, two of which adorned the aerobically developed bodies of Mr. and Mrs. Robert Fiorenze—better known as Bob and Annie, and better recognized as Mr. F-4 Playboy Bunny and lovely wife. I wondered why they chose to promote the Yellow Aircraft Company (notwithstanding the fact that the shirts were probably gratis!). Well fan fans, here's the scoop: Bob has joined the ever-expanding Yellow Aircraft team

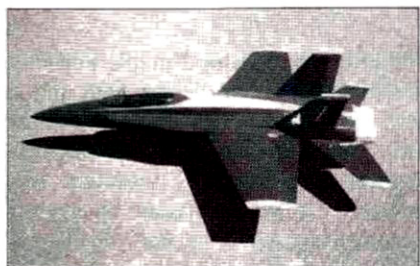


Testors' plastic model of the F-19 stealth-technology fighter. Does the real one exist or not?

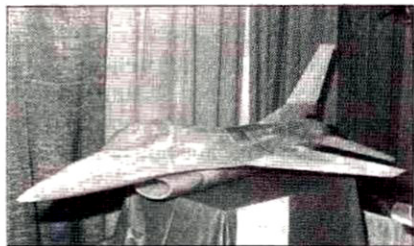


Ralph Saldivar's plug developed from plastic kit above. Prototype fiberglass versions ready for flight test.

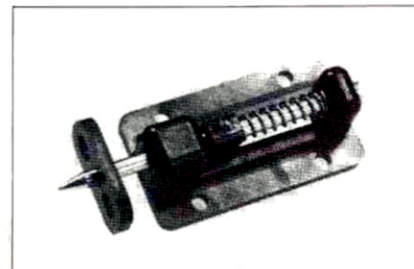
and, sometime soon, he'll relocate from New York to sunny Florida to open what is being described as an "R/C hobby center, mail-order operation and showroom." Now, I don't know exactly what that might be, but I conjure up an image of a place where you walk in, select your model, add the options and come back later to pick up the machine... "local taxes, transportation and delivery charges not included." Can you imagine? There could even be an outdoor "used-airplane



Sharp-looking F/A-18 Hornet from MDM. Single engine, Turbax I and O.S. 46 powerplant. One day's work from box to flight line claimed!!



Next addition to Bob Violett Models scale line is this F-16, latest "C" model. Proto kit looked great.



Ever try making one of these? "Hatch attach" is one of numerous molded Violett accessories developed for fans, but with widespread application.

lot," or "previously owned vehicle display."

Whatever the objective, Bob reports that he's looking forward to this new venture and promises to keep us posted on new developments, one of which is the establishment of a new phone number for ordering products. This one goes directly to the Washington warehouse and connects you to Ronnie Kemp, who sends shipments to all parts of the country. The change is intended to streamline service significantly. The new number is (206) 845-8195.

Fuels

Byron Originals* is now in the fuel business and is offering three different nitro-content blends for the modeler: 5 percent, 10 percent and 20 percent. Lubrication ingredients are reported to be totally synthetic, or synthetic/castor mix: modeler's choice. Byron Originals reports that the fuels are blended by computer to ensure that modelers receive a consistent batch-to-batch mix. We've received two gallons here at the office; we'll try them out and advise you of our findings.

One cautionary note, though: Shortly after receiving the two sample gallons, we heard—at length—from Marc Jensen of the Byron Originals marketing department. Mr. Jensen describes some extensive testing performed at their plant. They've concluded that the popular O.S. 77 fan engine, when operating in a Dynamax fan unit at around 23,000rpm, *should not* be run on their fuel.

These tests were precipitated by a report from Tom Cook of Jet Model Products* that the fuel "was lacking proper lubrication to protect against engine seizure." Five tests were run at the Byron facility, each using different fuels and propellers to enable the O.S. to reach 23,000rpm. Result: five rod failures/engine seizures. Byron Originals' conclusion: "The engine simply cannot hold together at these high rpm levels and it was never intended to. This engine, when designed for ducted-fan use, was specif-

ically designed around the 6-inch inside-diameter-size of the Byro-Jet ducted fan and wasn't designed for use in smaller, higher-rpm fans." The Byron Originals recommendations: "We don't recommend the use of Byro-Jet fuel with the O.S. 77 engine in any smaller fan or with a propeller that might allow the engine to near the 23,000rpm range."

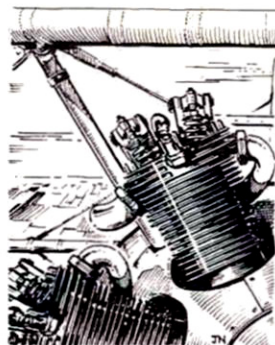
What a refreshing change! A company that advises you *not* to use its product because it may do damage! Those of you out there currently using the Dynamax/O.S. 77 combination: If your present choice of fuel is working, continue with it.

F/A-18 Hornet

There's another F/A-18 Hornet in the works! This one will probably appeal to the modeler who prefers the simplicity of single-engine operation. Although nearly all of us are awed when we watch the fire-breathing twins perform, they *are* more complex and maintenance-intense. Pat Grubbs of MDM* has developed, and successfully flown, a single-engine version that uses the 5-inch Dynamax or Turbax* fan unit.

The interesting thing here is that MDM supplies the kit in ultra-complete form, including all hardware, epoxy and even pin-hole filler! Pat claims that your Hornet can be ready for paint in less than a day after receiving your kit. The foam cores (wing, stabilizers and vertical fins) are pre-sheathed with balsa, and the fiberglass fuselage has all the bulkheads installed at the factory. The Turbax I/O.S. 46-powered prototype weighs 8.5 pounds, and spans 41.5 inches with 620 square inches of area. Fuselage length is 56 inches, which is a nice, comfortable size. The video Pat sent shows that this Hornet flies pretty well. I'm glad to see a new jet in this size, because the Turbax I, which is a great little unit, seems to have been displaced by the Turbax III or Dynamax systems by fliers who want more thrust, without regard for the significantly

(Continued on page 64)



Four-Cycle Forum

by CHRIS ABATE

EVERY CONSTRUCTION needs a good solid foundation. Whether it's a house or a bridge, a strong base is paramount, and the world of R/C is no exception to this. You'd better make a strong base for your landing gear, or after that first hard landing, the gear is history! The same goes for your radio equipment and, of course, your engine needs a very strong foundation. You guessed it; my topic is the installation of that 4-stroker.

I mentioned foundation; there are two: the fire wall is one and the engine mount is the other. Install the fire wall as the manufacturer suggests, and make sure that it's strong and well-supported. The other foundation is the engine mount.



Did Chris Abate just take a gulp of sour milk, or is the man next to him delivering the news that Chris Chianelli has a New Saito 300?

What are we trying to achieve when we install an engine mount? It's very simple; we want a strong, inflexible installation that's as close to the fire wall as possible to reduce vibration. The farther away from the fire wall, the more vibration you can expect. Think of your engine mount as a diving board at a swimming pool. The closer you venture toward the end of the board, the more spring (vibration) you get. To a certain extent, this is what your engine will experience, and vibration is death to a 4-stroke.

Another very important point to remember is that when drilling out the

engine mount (no matter what kind) you must drill the holes perpendicular to the top rails of the mount. This will ensure that, when tightened, the bolt-heads rest flat on the engine-mounting flanges, so eliminating the possibility of the heads breaking off through fatigue or stress. *Don't* use wood-screw-type screws to mount your engine; drill and tap! If wooden rails are used, use blind-nuts. *Don't* drill and tap wood; it will fail with use or strip out when the screws are tightened.

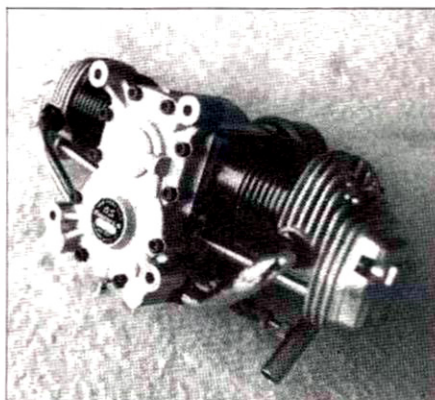
Types of Mounts

There are basically four types of engine mounts: those of glass-filled nylon; metal ones, which look like the glass-filled ones, but are made of machined or forged metal; wooden rails, to which the engine is bolted; and some engines have a backplate that doubles as a mount.

In my opinion, the glass-filled nylon mounts should be used with displacements of no more than .50-size engines. For larger engines (.50 and above), I strongly suggest the use of metal mounts.

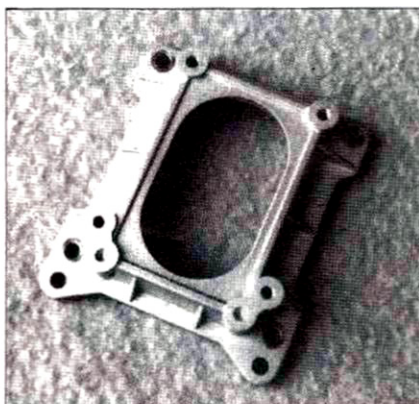
Remember I said you should keep the engine as close as possible to the fire wall? When using either the nylon or the metal mounts, the carburetors will make it difficult to move the engine back, because this is the first part of the engine to hit the backplate of the mount. By cutting away part of the mount in a V-shape, or cutting off enough straight across, parallel to the top, to clear the carburetor, you can gain a little more distance. When trying to get the engine as far back as possible, you may encounter a problem with hooking up the throttle linkage. If it isn't possible to hook up straight to the throttle arm, bring the pushrod past the center of the arm, make a U-bend in it and attach the link from in front of the arm, not behind it.

Wooden rail mounts are most often found in scratch-built aircraft or some of the older kit designs. These are exactly what their name implies: parallel wooden rails to which the engine is bolted. They

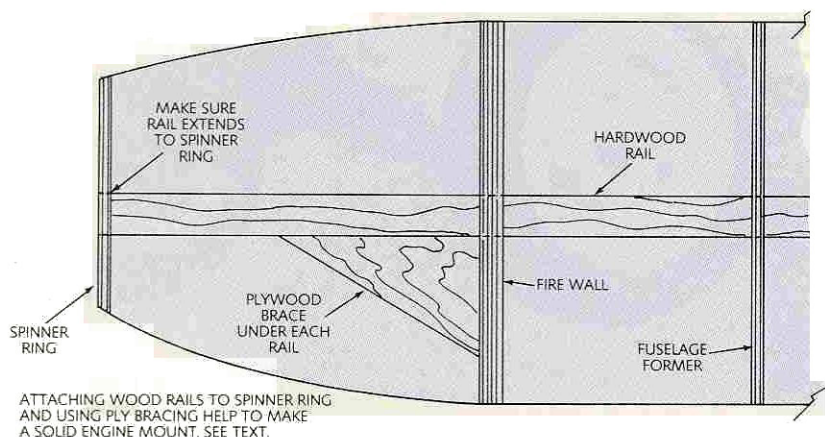


The O.S. 1.20 twin's back-plate doubles as an engine mount. Most multi-cylinder engines utilize this type of mount.

should be of rock-hard maple and they should run through the fire wall and at least one fuselage former aft of the fire wall. This is all right, but remember our diving-board example? Vibration is a problem. To help strengthen this type of mount, design a new one that will also run along and attach to the spinner ring. Use a couple of pieces of plywood glued to the bottom of the rail and the front of the fire wall to act as a brace (triangular-shaped pieces, with tips long enough to reach halfway between the spinner ring and the fire wall). This will greatly help to reduce vibration. Further, when drilling holes for the mounting bolts, make sure that the grain is running *with* the bolt hole, so drill



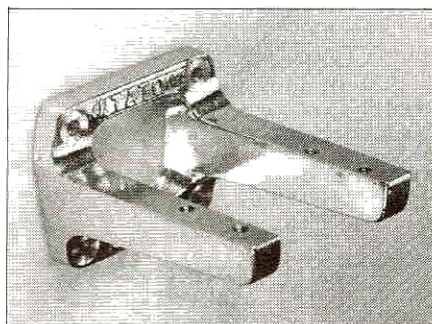
Extensions are available for some engines. This one is for use on the O.S. 1.20 twin.



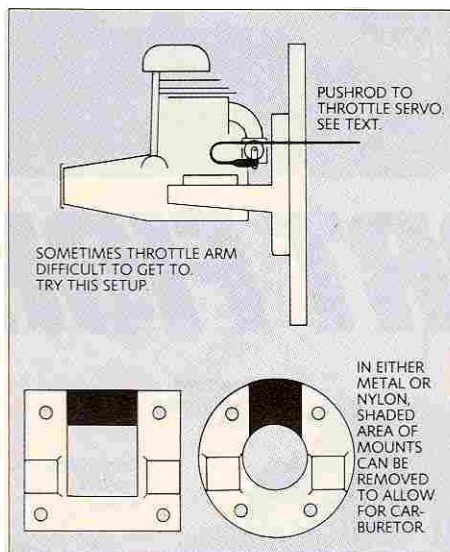
Above: (Clockwise) This is a good way out of difficult throttle situations: Use piano wire. Remove shaded area, if it conflicts with carb. Attaching wooden rails to spinner ring and using ply bracing helps to make a solid engine mount. (See text.)

with the grain and *not* through it. When the engine has been tightened down, it's more difficult to compress the grain in this manner. An aluminum strip on top of the rails will also help to prevent the wood from compressing over time. If you use this method, remember to allow the thickness of the aluminum in relation to the thrust line of the aircraft. Again, remember *not* to tap and drill the wood; use a blind-nut from the bottom.

The mounts that are part of the engine backplate are the easiest to install. These are most often found on multi-cylinder engines. To install this type, drill mounting holes on the fire wall and use blind-nuts and bolts to attach the engine.



Typical metal mount. Glass-filled nylon mounts look basically the same—just different material.



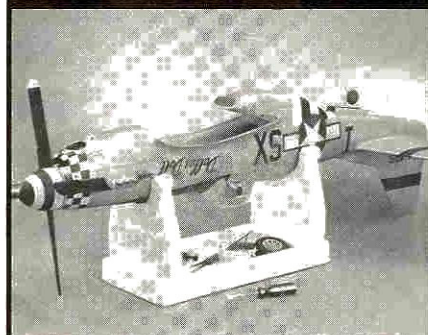
A number of manufacturers make engine mounts; J'Tec* manufactures a complete line, some of which are pre-drilled. Engine manufacturers also offer them, but these sometimes cost more than other available mounts. I strongly suggest that you use a thread-locking compound. This compound will help to keep the mounting screws in place and prevent them from vibrating loose. Loctite's* 242 Thread-Locker is perfect for this.

I've really appreciated your letters. How about sending some *photos* of your 4-stroke-powered aircraft? They can't be that bad-looking!

*Here are the addresses of the manufacturers mentioned in this article:

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Loctite Corp., 18731 Cranwood Park,
Cleveland, OH 44128.

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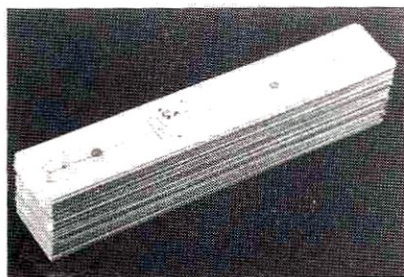
Basics of Radio Control

by RANDY RANDOLPH

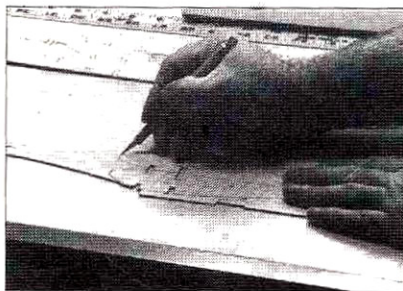
WITH THE EXCEPTION of wings that are cut from sheets of foam, the rib is the basic wing-forming component. Even in the manufacture of foam wings, airfoil templates that look like ribs are used to reproduce the desired shape and size. The rib is responsible for the airfoil, and for the thickness and width of the wing, as well as for locating the leading edge, the spars and the trailing edge, which are the load-carrying members of the wing.

Most modern kits provide ribs that are conveniently pre-formed, but if you want to build from plans rather than from a kit, forming the ribs is not as formidable a task as you might think. Two methods will be described: one for those who have access to power equipment, and one for those who operate with only a modeling knife and a straightedge.

Using either method, you first have to make a good, accurate template of the rib. Templates can be made in several ways. The rib outline can be transferred to cardboard stock by first tracing the outline onto thin paper, then gluing this tracing to the heavier stock and finally cutting the template. Alternatively, the semi-transparent plastic material that's packed with sliced bacon is excellent template material, because the rib outline can be traced through it without an intermediate step, and it makes a durable template. Always check the accuracy of the finished template.

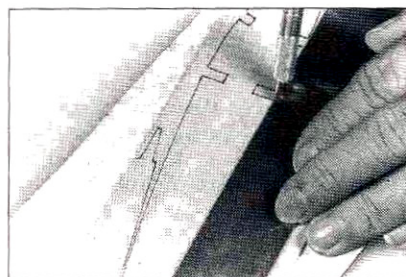


Stacking rib blanks, then sanding and sawing to outline is one way to make ribs—but not the only way!

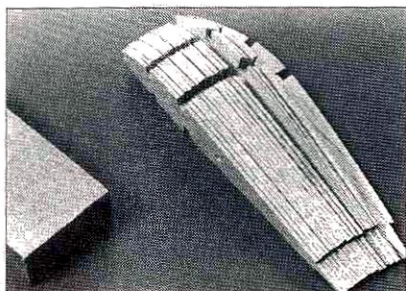


Tracing and cutting rib outlines on sheet balsa takes a little time, but saves a lot of material.

If you have a belt sander or a disk sander and a band saw, rib blanks cut from balsa can be stacked, pinned together and finished simultaneously. The template is pinned to the top of the stack, which is then sanded to the outline shape. When the correct outline has been achieved, the band saw is used to saw the spar notches and the leading and trailing



A metal straightedge and a sharp knife are a great help in slicing ribs from a printed sheet.



It's hard to differentiate sliced ribs that have been pinned together and sanded, from those made with power equipment.

edges into the shaped block. Finally, the pins are removed to reveal the completed ribs.

Using the template to make a "printed sheet" of ribs by tracing around it on sheet balsa with a fine-tip pen has two advantages over the sand-and-saw method, and one *disadvantage!* The advantages: No power equipment is necessary, and a

duke's mixture



One of the most elusive skills a newcomer to our hobby needs to develop is the ability to set his carburetor adjustments so that the motor will continue to run with maximum reliability. The problem is not how to move an adjustment to make the motor leaner or richer, but to sense what the engine wants and to determine where it is now. From years of experience, I have determined that the most reliable settings are a little rich at idle, and as the throttle is opened, leaning into a maximum power setting at mid-range, and then as the throttle continues to open to full throttle, to slightly richen. Most modelers that have been in the hobby a few years have no problem doing this, but newcomers often do. Since fuel mixtures, propeller sizes, heat, humidity, and altitude all affect the mixture requirements of a motor, it is impossible for a manufacturer to set a carburetor permanently and have it right for all conditions and all models. As a result, carburetor adjustments are likely to always be with us.

Now, setting the high speed is not all that difficult. The throttle is opened wide open and the high speed is needled until your ear says you have maximum RPM. Then, the needle is backed out until the engine slows slightly. Just how much you want it to slow will depend on a variety of conditions, but on an average model, usually 300 or 400 RPM richer than maximum power works well. This can be obtained without too much trouble with the use of a tachometer. Just about any kind of tachometer will do. It does not have to be fancy or super accurate. After a few go's, you will learn to recognize a reliable full power setting by the sound of the motor.

The mid-range is no real problem because you would set your throttle at about half open and make your mid-range adjustment until the engine is running at maximum power, and then back the adjustment out until you detect the engine slowing down, and then bring it back in a whisker.

The most reliable idle is obtained when the mixture is rich enough for the motor to run at about 75% of the speed it would run with a full lean mixture at that same throttle opening. This sounds simple, but the fact that at idle fuel can accumulate in the crankcase confuses the issue. A motor can be way rich at idle, and when you pull the throttle back, seem to do just fine, but after 10 or 15 seconds, significant quantities of fuel start to accumulate in the crankcase, and the motor will go slower and slower, and, eventually, flame out. Or, if it doesn't, when you give your motor the throttle, the added RPM is enough to move this accumulated fuel to the upper cylinder, and the plug is quenched, and you flame out. The best way that I have found to make an idle adjustment is to pull the engine back to what seems to be a reasonable idle speed, leaving the glow plug heater on, and then pinch the fuel line tightly, close to the carburetor, and listen as the motor runs the fuel out of the crankcase. If the motor runs on for 12 or 15 seconds, and gradually increases in speed, you can be sure that it is too rich. A 7 or 8 second run on time, and slight increase in RPM, seems to be optimum for most installations. In doing this with the heater on the glow plug, you save yourself a lot of cranking, and you separate the problem

of the plug cooling from the problem of an incorrect fuel mixture. It doesn't sound too difficult, however, there is a fly or two in the ointment. Number one is that the engine doesn't always do the same thing with the plug heater removed as it does with the heater on. If the engine slows substantially when the glow plug heat is removed, more nitro or a new plug is indicated. A full lean setting at idle idles reliably, but there is a problem on take off because the combination of the airplane accelerating and the increased fuel demand on opening the throttle causes the motor to go over lean and quit. Another problem is that Fox carburetors, and most other brands today, have no easy way of adjusting the intermediate, since this is built into the needle taper. Reducing the needle diameter right at the tip is a fairly reliable way of richening the mid-range. However, if your mid-range is too rich, it is a little bit more difficult. Our instruction manuals give a little more detail on how to tailor your low speed needle to get your mid-range the way you want it.

If you have been having problems with your motor quitting on take off or go arounds, or quitting at idle while taxiing out, follow this procedure and see if it doesn't help. This is applicable to just about all brands of RC model airplane motors. It works on our competition about as well as it does on Fox motors.

Happy Flying,

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sheet of balsa will produce more ribs, thereby reducing the cost of building. The disadvantage: It takes a little longer to make the ribs.

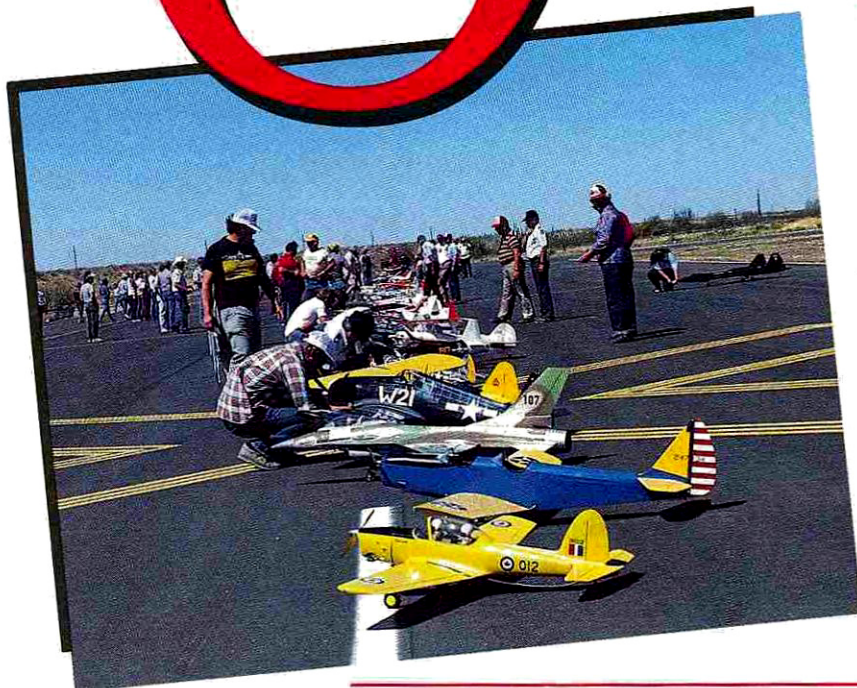
When tracing the rib outlines onto the balsa sheet, careful placement of the ribs will conserve balsa, and you'll be able to cut them out with a razor knife faster and easier. Ribs with flat bottoms can be drawn along the straight edges of the sheet or with one common line separating two ribs. If spar notches are matched, they can be cut in two ribs at once. The wider parts of the ribs can be interlaced with the more slender trailing edges, so making maximum use of the wood, and discarding as little as possible. In some ways, rib placement on a sheet of balsa resembles a jigsaw puzzle, and it can be treated as a game with only one rule: the grain should run the full length of the ribs.

To trim the ribs from the sheet, you'll need a razor knife with a sharp, pointed blade similar to famous "number 11." There are several easy-to-follow cutting rules. First, cut *on* the line, or as close to it as you can. While cutting, hold the knife perpendicular to the balsa sheet and use a metal straightedge. Last, cut in such a way that at any time when the grain of the wood might split or guide the blade, the cut would be *away* from the part. For example, slice from the top spar notch toward the trailing edge, then from the notch toward the leading edge to cut the top camber of the rib. One more hint: It's easier to first cut the spar notches in all the ribs, then the leading and trailing edges and, finally, the outlines.

When all the ribs have been cut out, pin them together, put scrap spar material in the notches, and sand them all to the same shape with a sanding block. This will eliminate unevenness and produce smooth, accurate ribs. If the finished model will be covered with one of the great plastic films, why not drill some holes in the ribs while they're pinned together, so the film can "breathe" through the tips or servo well? In this way, it won't "balloon" when it's heat-shrunk.

If you have a problem in assembly, construction or operation, let me know. Although I can't answer everyone individually, the most frequently mentioned problems will be discussed in these pages. This is a great sport, and *all* aspects of it should be fun. That's *basic*!

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HTH FORCE SPRING '88 LE FLY-IN

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PARSONS

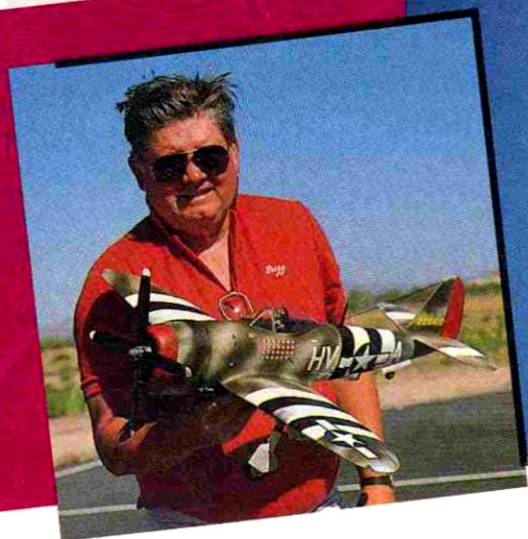


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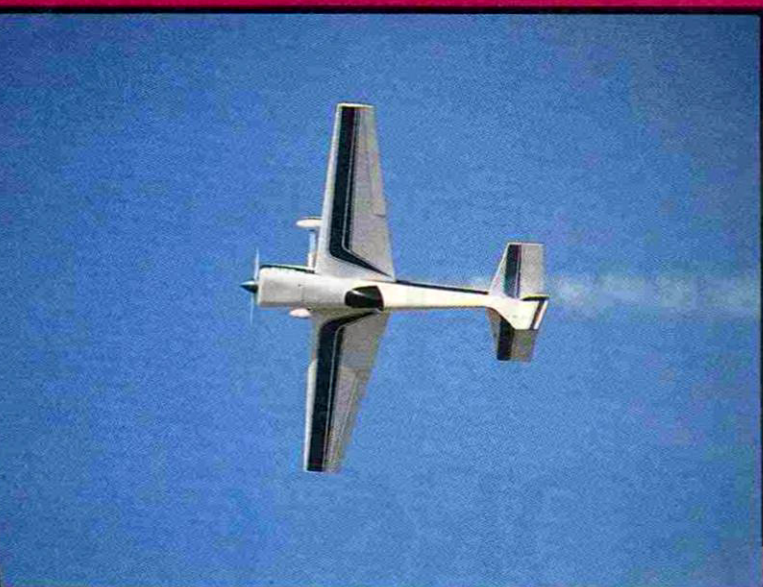
TO THIS THREE- DAY MEET!!

One-Eighth Air Force Scale Fly-In



Above Left: Buzz Watson's amazing baby P-47.

Above: Frank Noll's big Extra 230 starting a one-and-a-half snap-roll on takeoff.



THIS YEAR, COL. BOB MOSHER and his wife, Bobbie, had twice as much incentive to undertake their annual trek all the way from San Antonio, TX, to the 1/8 Air Force Scale Fly-In held near Phoenix, AZ, on March 19 and 20. Their granddaughter's husband, who had recently been assigned to the Thunderbirds demonstration team, would be flying the number-two position in the Thunderbirds' show on Saturday, March 19, at nearby Williams AFB. So, on Saturday morning, Bob flew his Christen Eagle at the 1/8 Fly-In, and then he and Bobbie left for Williams AFB. On the following day, Capt. Dana Atkins, the Thunderbird's newest member, returned the compliment by coming to the field and watching Bob fly his Eagle.

As usual, the 1/8 Fly-In was given a rousing unofficial start by 40 early birds, who showed up on Friday and filled the Arizona skies with beautiful, well-flown

scale planes.

Though slowed a little during Friday morning by stiff and gusty crosswinds, a few stalwarts weren't prepared to sit around and wait for the winds to abate. Tom Perry, from Converse, TX, blasted off with his Byron* F-16, appropriately painted in the Thunderbird scheme and, despite the wind, he put on a good show. When it was time to land, poor conditions necessitated two realistic go-arounds, and we all kept our fingers crossed! On the third attempt, Tom put that F-16 on the runway

(Continued on page 45)



Above: Jim Morrow's big deH. Moth.
Left: Mike Scott and his outstanding Cook F-4 Phantom.

SB2U-1 VINDICATOR

(Continued from page 17)

two retract units with worm gears driving Delrin yokes that actuate scale drag links to pull the gears backward 100 degrees while rotating 90 degrees—all in exactly eight seconds! When the battery has been charged, one can obtain at least 60 cycles, which is more than enough for a contest day's flying and showing off to fascinated modelers. If you don't believe that eight seconds isn't exactly to scale, watch the movie "Dive Bomber." Vindicators are the main aircraft featured in the movie, and one sequence shows the gears going up. Count the time; it's *exactly* eight seconds, and both gears retract simultaneously; no sequencing doors, no air restrictors; just plain, unadulterated scale speed.

Vindicator No. 2 boasted two pilots and a rear gunner, more detail in the rear cockpit, a fantastic shock-absorbing, steerable tail wheel and, unfortunately, about two more pounds of weight. At 1,220 square inches, this does a number on wing loading, but the original SB2U-1 was a heavy Navy dive bomber with a top speed of 231 mph.

For the initial test-flight take-offs, we hoped to salvage the USS Saratoga, but the Pacific water where I think it lies is too deep, so we opted for the Madera Airport.

Our first attempts were good and bad: Flying was beautiful; grooved like a pattern ship; looked like the real thing, but the wheels were *bad!* The original Hobby Lobby* 4¾-inch wheels couldn't take the beating and gave up immediately, flexing off the rims, binding on the struts and talk about having ground loops! Also, a progressive spring arrangement in the gears locked one gear down lower than the other. Back to the ranch for more improvements! However, the retract gear worked flawlessly and was awesome to watch in flight. Byron* 4¾-inch-diameter wheels were selected, and after precise machining (including bronze bearings), and with an aluminum-sleeve coupling and both halves joined, we had a winning combination.

After 16 flights, a new decision was reached: enter Vindicator No. 3. "Ee-gads," you're probably saying; but remember, if it wasn't to be, you wouldn't be reading this now! What prompted No. 3? After much consideration, Stan, Larry and I were unanimous that the third time would be a charm if we kept these goals in mind:

- A more lifting airfoil was needed. The

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SB2U-1 VINDICATOR

present airfoil was good for flying, but landings left something to be desired. The airfoil was too close to symmetrical to create enough drag at landing speeds and, therefore, the safe-landing-speed range was very narrow—about 5mph. Faster would be *too* fast, and slower would drop it too hard, so causing havoc with the gear.

- The total weight should be reduced by at least four pounds; this prompted an all-new construction method.
- The new airfoil should cut down the original wing incidence of 2 degrees with 2 degrees washout to 1 degree and 0 degree washout.
- We should use a predominance of light balsa and eliminate some of the spruce, which we felt was overkill. I tend to build scale planes resembling General Sherman tanks!

During the summer of '87, I entered the *Model Airplane News* R/C "Design an Airplane Contest" and, to my delight, took third place in over 400 entries.

I've never really wanted to spend time drawing detailed construction plans of my creations or taking about 100 black-and-white photos along the way, because

there are so many planes to build and so little time. I could be well under way with an Aichi D3A Val dive bomber by now!

Anyway, enough of all this; let's get down to the basics. First of all, this model is dedicated to the truly obsessed. To build this Vindicator you need a number of qualifications: You love colorful, super-flying, late-1930s Navy aircraft with chrome-yellow wings and colored tails. You're an innovative artisan who wants to be creative. You don't mind six months to a year of hard labor. You're looking for something exciting to get your hands on. You're tired of flying P-47s, FW-190s, etc. You'd like to get your picture in a magazine. Your IQ is at least average. You're not married, or have a truly understanding wife (as I do). You dare to be different!

If you have these qualifications, you're ready to engage in a once-in-a-lifetime project, and you'll be glad you did. Now, all you need to start is a set of plans.

**Here are the addresses of the companies mentioned in this article:*

Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616.

Dave Platt Models, 6951 Northwest 15th

Ave., Fort Lauderdale, FL 33309.

Hobby Lobby International, 5614 Franklin Pike Cr., P.O. Box 285, Brentwood, TN 37027.

Byron Originals, P.O. Box 279, Ida Grove, IA 51445.

KYOSHO PLANET 40

(Continued from page 23)

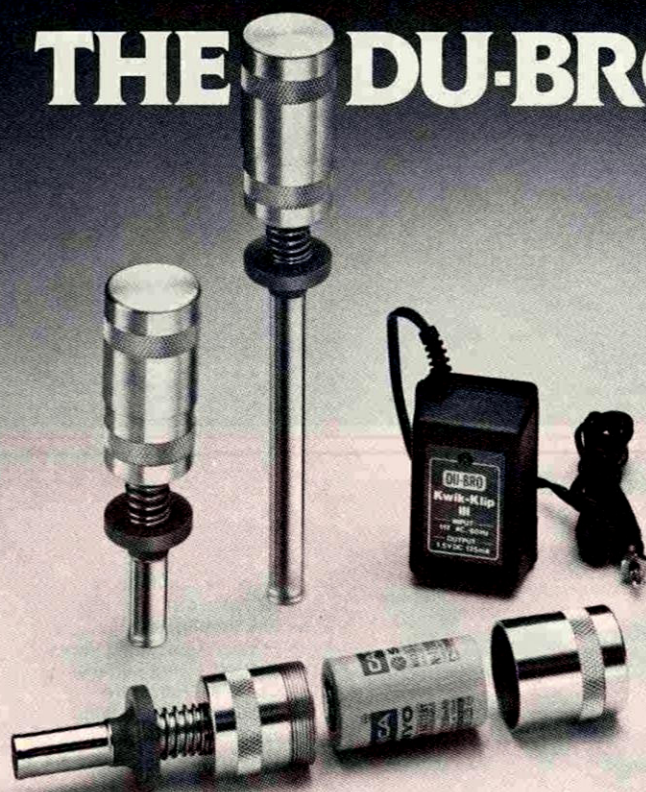
servo tray fits behind the cockpit, nearly at the wing trailing edge, and the receiver and battery are located in the shallow section under the cockpit floor. Sure enough, with the equipment installed as shown, the Planet would have needed 5 ounces of weight at the fire wall to balance as it should. Out came the tank, so that I could move the battery into the forward compartment and then install the tank over the battery. The plane could then be balanced with only 2 ounces of Harry Higley* screw-on weights on the front of the fire wall.

With the radio thus installed and the pushrods hooked up, I checked the instructions for recommended control-surface throws, but didn't find any. Oh, well! I settled on 1/4 inch each way for

(Continued on page 48)

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One-Eighth Air Force Scale Fly-In

(Continued from page 42)

hard, but it wasn't damaged. Later, during the meet, he flew his good-looking Sterner T-33 ducted fan. As with the F-80 he flew here last year, the large tip tanks added a lot to its presence in the air, and Tom says that the tanks also added stability and smoothness to its flight.

Those of us who are less intrepid waited to fly until the winds moderated at about 1 p.m. Then the sky quickly filled with planes. At times, there were as many as six flying, but the pilots, by flying a race-track pattern, kept the events manageable. Four big war birds chased tails and vied for low-pass honors, while a hot Violet* Sport Shark (done up as an F-20) passed them as though they were standing still. In the midst of this high-powered flying was a Fleet bipe nonchalantly puttering about! What a contrast!

The Violet Sport Shark was flown by Steve Korney with one of his own Hurricane fans turned

Best Civilian Flights

- 1st: Frank Noll—Extra 230
- 2nd: Billy Hempel—Cub
- 3rd: Jerry Kitchin—Christen Eagle

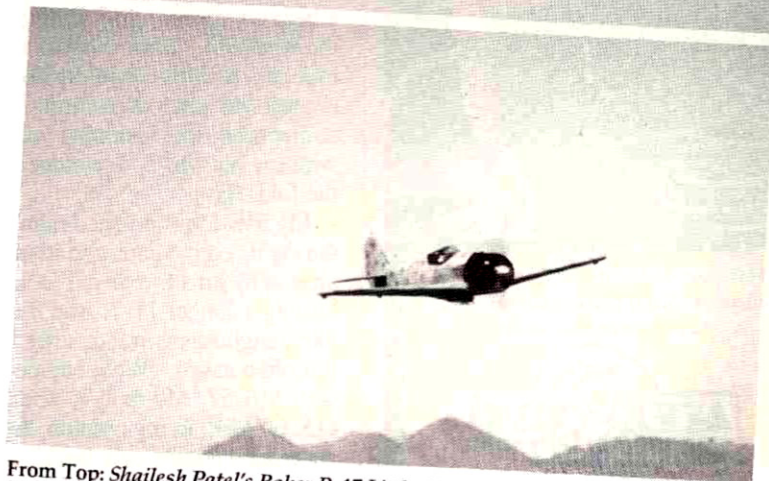
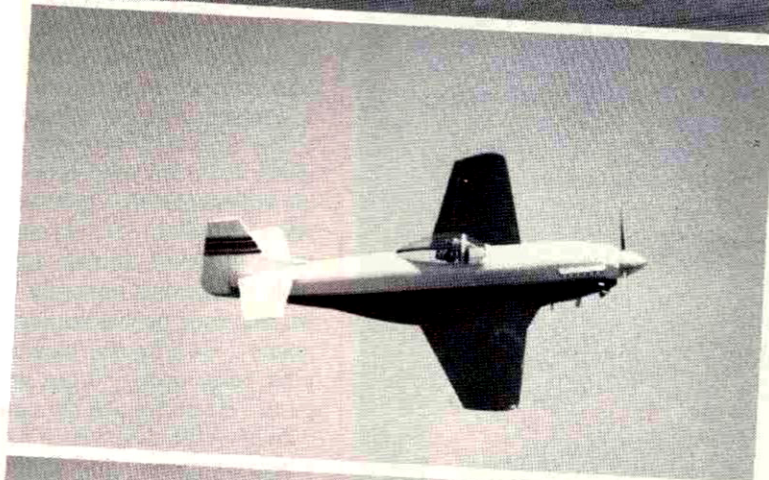
Best Military Flights

- 1st: Shailesh Patel—Scale Flight P-47
- 2nd: Mike Scott—F-4 Phantom
- 3rd: Jerry Rhodes—Bristol Scout

by a Picco 90. Interestingly, Steve has a Digicon Teletachometer unit installed in the plane so he can read the airspeed continuously from the receiver unit on the ground. He reported straight and level speeds of 160mph. The small sensor propeller installed in the nose gave the plane a definite "prototype" look.

Shortly after lunch on Friday, while I was busy shooting pictures of beautiful planes in flight, I felt a tap on my shoulder. Frank Noll stood there, grinning broadly. After swapping greetings and hand-pumps, Frank wasted no time in readying his newest 1/3-scale Extra 230 and firing up the Zenoah 62 he had recently reworked.

When Frank taxied out to take off, no one else was flying. After his long, straight takeoff run with full smoke on and his spectacular one-and-a-half snap-roll right after takeoff at a height of about 15 feet, everyone just stopped what they were doing and watched this outstanding pilot's display. Frank exactly follows Leo Loudenslager's routines, and he does it perfectly. His snap-rolls going in all directions, his torque-rolls with that big Extra 230 hanging motionless on the prop (while being engulfed in thick smoke), his slow rolls and point-rolls, and other maneuvers too numerous to mention, are all so perfect and so realistic that there's no way I can



From Top: Shailesh Patel's Baker P-47 Little Chief on close-in fly-by; Byron F-16 just after liftoff. (Note tail-pipe blast raising runway dust); Jim Malek's A&A Industries, formerly Bud Nosen Models, P-51 dips wing on fly-by; Denny DeWeese's Don Lien Models FW-190 makes realistic camera pass.

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One-Eighth Air Force Scale Fly-In



Above: Gene Barton caught our author's Parsons MB-5 in a low, curving pass.
Below: Barton's 100-inch Baker P-38 coming in full-bore with both smokers on.

adequately describe them. As that old saying goes: They must be seen to be believed. Frank's finishing touch is always a slip to a precise three-point landing.

Top-notch scale flier, Garland "Ham" Hamilton, started Friday afternoon's activities. He had essentially been out of hobby R/C for four years while on special assignment with the Marine Corps' mini-RPV program. Garland didn't waste any time in readying his big, immaculate ST 2500-powered R.T. Associates Corp.* T-34T and a new, much smaller A-26 twin. Like Frank Noll, Ham would rather fly R/C than eat, and soon he was putting his 20-pound T-34T through slow rolls, loops, point-rolls, touch-and-gos and long, low passes. He performed the same routine with his A-26 twin, which never missed a beat on either engine. By the end of the weekend, I think most of us agreed that he'd won the unofficial low-pass contest. He had lots of strong competitors, too, including yours truly with my old MB-5. Welcome back into the fold, Ham.

My MB-5 has notched many flights during its eight years, and it's still pulled around by an 11-year-old O.S. 60 FSR turning a Zinger 11-7. And it *still* goes like gangbusters! In fact, after flights, I'm often asked, "What engine is in your MB-5?" My reply? "The original O.S. 60 FSR; in my opinion, the best all-around engine ever built." This engine has thrived on Red Max, 5-percent nitro fuel with all-synthetic oil.

A plane dear to the hearts of all lovers of World War II fighters is the



P-38, and Gene Barton brought his 100-inch-span Scale Flight* version that he flew beautifully. Powered by ST 3000s and weighing a hefty 37 pounds, it's fast, smooth and utterly magnificent in flight. There's no prettier sight than that of the twin booms in those sweeping, diving turns when the plane comes in for a low pass. Add smoke, as he has, and you have just about the ultimate in R/C.

Near the end of his first flight with the P-38, Gene lost an engine as he was barreling along the far edge of the runway in a 20-foot-high pass. This is a tough spot to be in, because he had to bring that crippled P-38 all the way around the pattern at low altitude to get back to the runway. I watched him carefully, and saw that he did everything perfectly. He kept the nose level, the speed up and the turns shallow; he coordinated the rudder with the ailerons and judiciously handled the power on the remaining good engine. As he gently turned on final and had the runway made, he came back on the power and eased that big P-38 on its main gear onto the runway's center stripe and slowly rolled to a stop, as the onlookers enthusiastically applauded.

(Continued on page 68)

KYOSHO PLANET 40

(Continued from page 44)

aileron and elevator travel and 1/2 inch for rudder, and this has proved to be fine.

PERFORMANCE: After a lengthy wait for good weather, Rich Uravitch and I decided to fly when the wind had subsided to about 20mph. A preflight inspection indicated that the top sheeting of one wing panel was lifting away from the ribs and leading edge, but the covering material was still holding it down. Confident that the situation wouldn't deteriorate, I aimed the Planet down the runway right into the wind and hit the throttle. The Planet took off in about 20 feet and, as I climbed out at about a 20-degree angle, I did an aileron roll. Sure, that was pretty impulsive on my part, but the model just felt that responsive right away.

Only a little down-trim and left-aileron trim were required for hands-off flight. With the Schneurle-ported .40 engine, the Planet was quite fast and very groovy, so it easily coped with the wind. After some mild aerobatics, I started flying lower and slower for Rich to get good close-in flight photos, and the model remained very stable and predictable.

Later that day, I was practically hovering into the wind right in front of the camera when the engine quit. The Planet sort of "pancaked" onto the ground, tearing off the bottom nose sheet and the landing gear and sending the wheel pants through the wing covering. The airframe, however, remained intact. So much for the first day!

Trying to preserve the original color scheme, I repaired the wing with assorted pieces of Ultracote* and MonoKote* trim-sheet. This wasn't a fun job, as the original material sags, bubbles, melts and comes unglued when heated. While fixing the landing gear, I installed a 1/8-inch ply doubler on the inside of the fuselage floor.

Since then, my Planet 40 has had lots more flights, and it has superb flying characteristics. Aerobatic maneuvers are on a par with current pattern-airplane designs, but the model can also just be flown for fun. It's really a dual-purpose sport and pattern model.

The Planet's great flying qualities, sharp appearance and reasonable price make it a good buy for modelers who lack the time, ambition or skills to build a

full kit. Unfortunately, problems like the loose wing sheeting and the weak landing-gear mounting are evidence of short cuts taken at the factory. Those who are already seasoned builders may be justifiably critical of the construction quality and the troublesome covering material. Nevertheless, ARFs like the Kyosho Planet 40 are selling like the proverbial hot cakes, both to newcomers and to experienced modelers. ARFs are certainly worth considering, especially since they fly so well.

*Here are the addresses of the companies mentioned in this article:

Great Planes Model Distributor, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820.

Tower Hobbies, 1608 Interstate Dr., P.O. Box 778, Champaign, IL 61820.

O.S.; distributed by Great Planes Model Distributor.

Loctite Corp., 18731 Cranwood Park, Cleveland, OH 44128.

Harry B. Higley & Sons, Inc., P.O. Box 532, Glenwood, IL 60425.

Ultracote; distributed by Carl Goldberg Models, Inc., 4734 W. Chicago Ave., Chicago, IL 60651.

MonoKote; distributed by Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616. ■



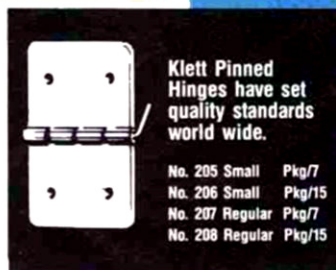
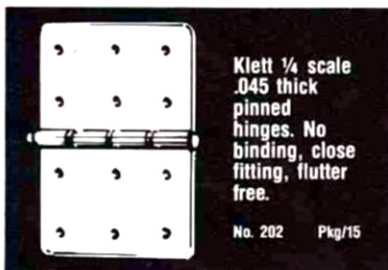
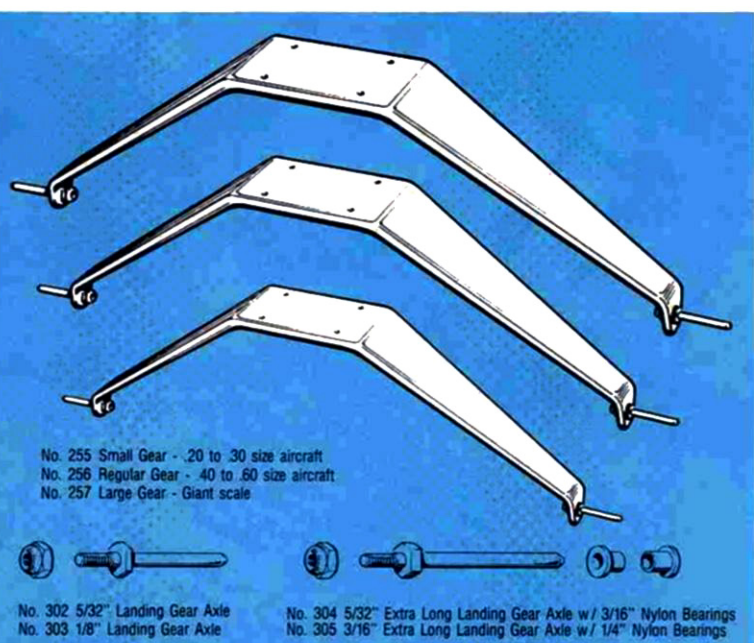
The all new break thru in high tech landing gears has set a new standard for many years to come. Glass filled resin to absorb that landing shock, and the "memory" to return to its original shape. Three sizes to fit your needs from .20 to giant scale.

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Klett Products are available exclusively from Carl Goldberg Models for your modeling enjoyment.

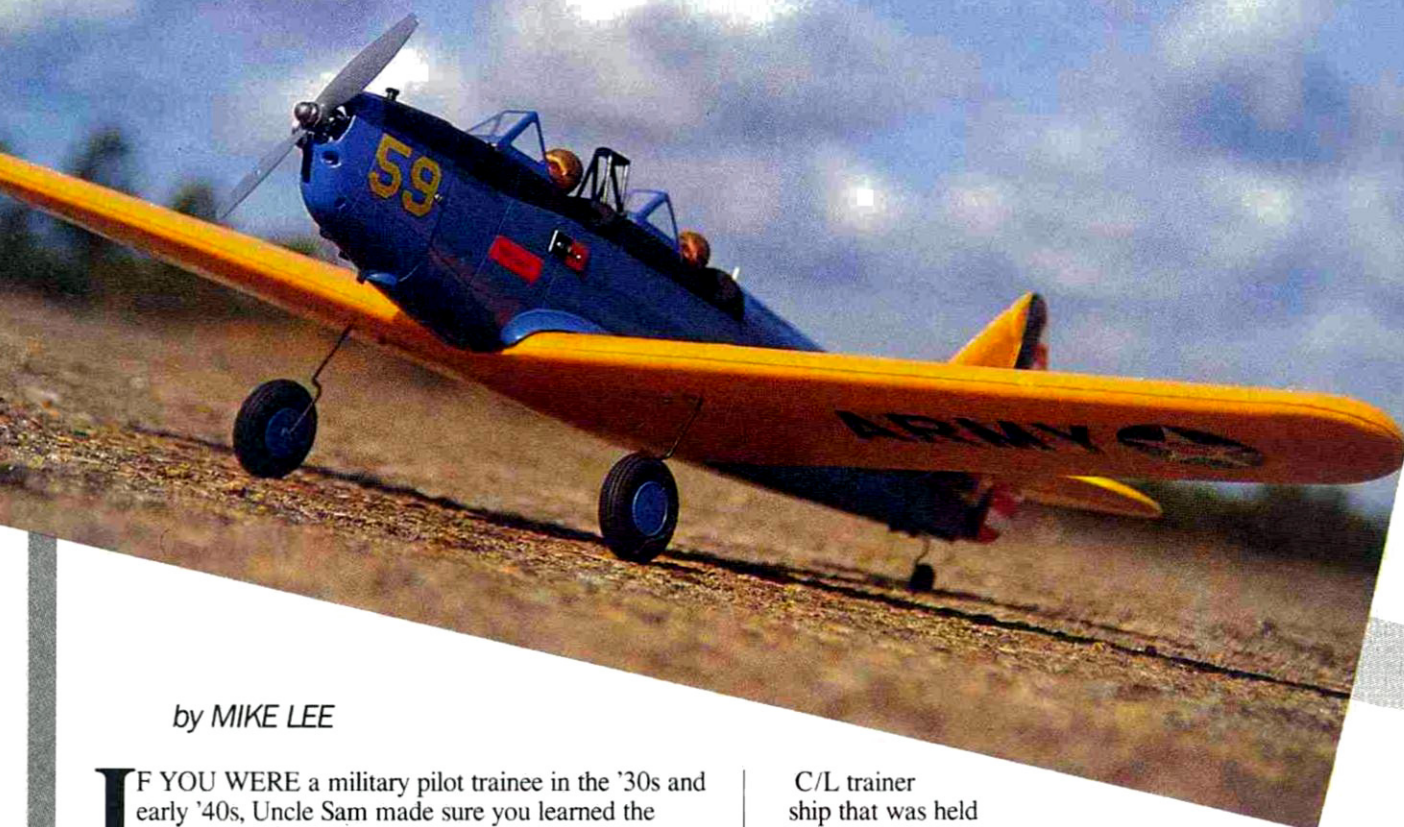
The PT-19 really does perform a good ground-launched takeoff. Not for beginners, but a fun bird for a change of pace.



COX HOBBIES

PT-19 TRAINER

ALL-MOLDED FOAM,
PPE-DECORATED 3-CHANNEL SCHOOL-YARDER!!



by MIKE LEE

IF YOU WERE a military pilot trainee in the '30s and early '40s, Uncle Sam made sure you learned the ropes in the PT-19, a rugged little monoplane made by Fairchild Aircraft. (PT-19 is a simple military abbreviation for Primary Trainer, type 19.) Thousands of pilots earned their wings in this sweet little plane, eventually graduating to more powerful war machines, but never forgetting the basic lessons learned in the PT-19.

During the '60s, the PT-19 made a comeback as a small plastic control-line (C/L) aircraft from Cox Hobbies*. Like its full-scale predecessor, the Cox PT-19 was a primary

C/L trainer ship that was held together with rubber bands and came apart on impact with the ground.

The PT-19 has now grown up a little: Cox produces an R/C version. Still powered by the famous .049 engine, the R/C PT-19 is an ARF-type aircraft constructed from high-density foam for 2-channel R/C. It's fully painted and built, and the builder has only to join the sub-assemblies and install a radio. Although not a primary trainer for R/C, the PT-19 may be a logical move upward

from the primary trainer to the first low-winger.

CONSTRUCTION: There really isn't any! Rather, a few sub-components have to be assembled, e.g., the wing and the fuselage.

Assembly begins at the fuselage. Starting at the tail, the horizontal stab is epoxied into place with one of the several small packets of fast-set epoxy that are supplied. When the stab has set, the vertical stab and rudder are put into place. Everything is hinged and ready, so there's no sweat here. A small rudder fairing completes the tail feathers.

I had one problem in assembling the PT-19, this being the wing-to-fuselage fit. The wing fit so closely to the fuselage that I had to trim a little off the wing trailing edge to make it fit. Since the kit is of molded foam, you'll probably encounter the same problem. Trim the wing as required; never try crushing the foam instead. Once fitted, the wing-hold-down screw is put into place, and we move on to the landing gear.

The landing gear is just pre-bent wires and some hefty-duty solid rubber tires. These tires will easily support heavy pattern birds, but they're not really overkill, as they add needed weight to the nose for balance. And, yes, this is a tail dragger—just like the real one. (More on that, later.)

At the tail, a fixed-position tail-wheel is held in place with two sheet-metal screws. This is a plastic affair, but quite adequate for the small bird it supports. The final items are the pilots, the windshield and the turnover pylon. For realism, pilot figures and windshields are a must.

I always wondered what that funny thing between the cockpits on top of the fuselage was, and now I know it's the turnover pylon. Personally, if I were given the chance to fly in a full-size aircraft that had this structure right out there for everyone to see, I'd think twice about it! However, that was the way it was!

The kit comes with a full set of Mylar decals to make the PT-19 look just like the picture on the box. These decals dress it quite nicely, and result in a very attractive little scale plane.

To keep weight to a minimum, the radio used for the PT-19 must be small. I chose the Cox Cadet, hooking up both control channels. The surfaces are hooked to the servos using straight piano wire that appears way too flimsy for actuating the tail. However, the wire has proven to be more than adequate, and has never been the cause of any surface failure in flight. A 500mAh battery pack fits in the nose, and then you seal it up with the wing.

In the nose, we find the latest version of the Cox .049—the Cox Ranger .049. (Editor's note: named, no doubt, after the full-scale PT-19's powerplant.) This version has a larger tank and the now-familiar Cox Snap Starter spring. The engine is already installed, and needs only fuel and a starting battery to bring it to life. The running time on the Ranger is about five minutes.

With radio, the finished PT-19 weighs about 24 ounces, ready to fly. This is quite hefty, but with the flat-bottom airfoil,

(Continued on page 104)

SPECIFICATIONS

Type: 1/2A sport-scale ARF

Span: 40 inches

Weight: 24 ounces

Area: 240 square inches

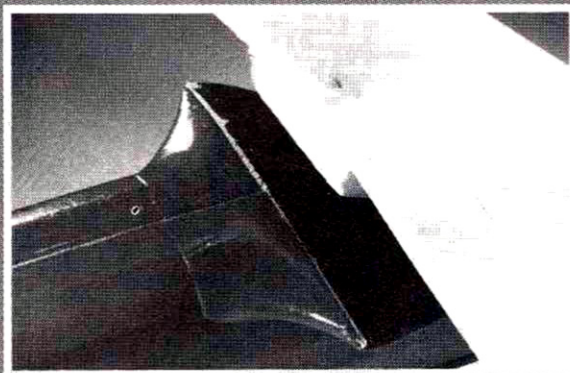
Wing loading: Approximately 15 ounces/square foot

Power req'd: .049 (included)

No. of channels req'd: Two

Suggested retail: \$136.95

Features: All-molded foam; fuelproof; pre-painted finish; .049 engine included and installed.



The inner trailing edge of the wing needed trimming for proper fit to saddle.

View from over the pilot's shoulder shows that Cox has even provided the cockpit instruments to complement their little PT-19. The Ranger .049 proved adequate for the job. Not recommended for beginners.

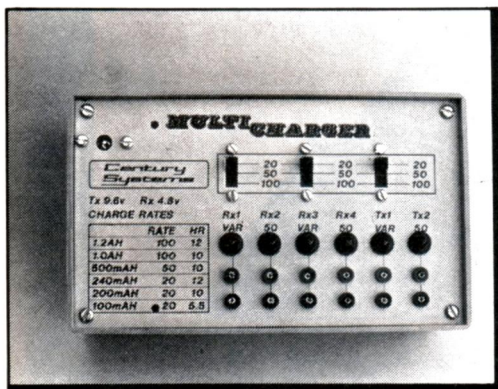


INNOVATIVE HELICOPTER PRODUCTS

by PAUL TRADELIUS

Here's a neat sample of goodies for you rotary-wing buffs

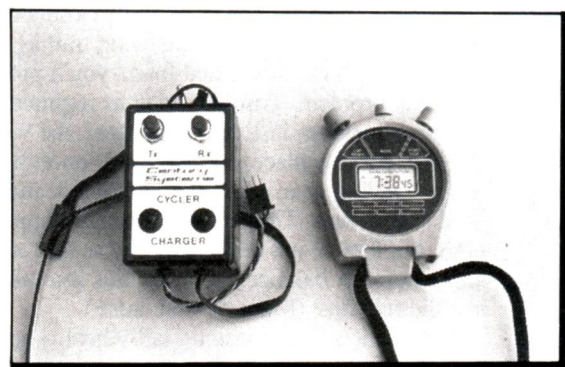
Century Systems of America* offers several products for both helicopter and fixed-wing enthusiasts. These include:



- **Multi-Charger** charges up to two transmitters and four receivers simultaneously. One transmitter charging jack and two receiver jacks are preset at 50mA charge rate, while the remaining two receiver and one transmitter charging jacks are individually "switchable" from 20mA, 50mA or 100mA charge rates to suit all battery sizes.
- **Battery Backer** is used inside your helicopter or airplane to switch to an auxiliary battery pack if the original battery fails or runs down.



- **Battery Checker** plugs into your charging jack or directly to the battery. A scale of different-color lights indicates the charge state of the battery.
- **Quest Gyro** is an in-flight, variable, sensitive gyro that reduces or eliminates unwanted oscillations, all contained in one small lightweight unit. Two gyros are available for either helicopter or fixed-wing operations.

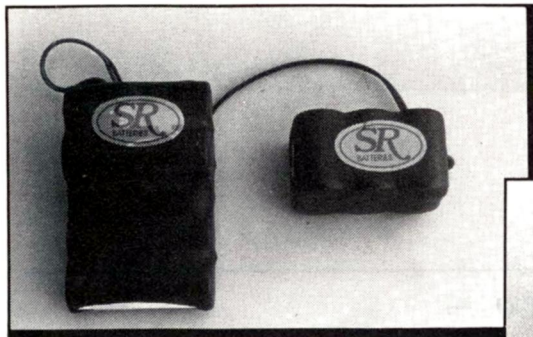


- **Auto Ni-Cd Cycler** works with your radio's charging unit to safely cycle both airborne and transmitter batteries, to check their capacity and destroy any memory build-up which could limit their useful working lives.
- **4-Channel Fail-Safe** is mounted inside the helicopter or airplane. It positions one to four servos to a preset position if the transmitter signal is interrupted or interfered with.



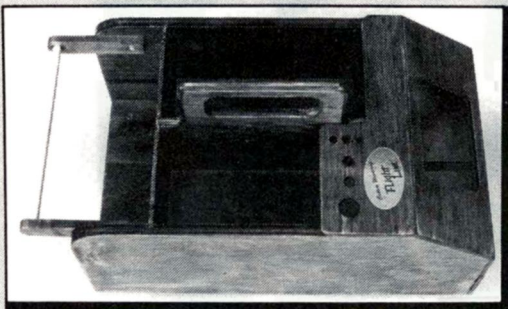
Miniature Aircraft U.S.A.* is now manufacturing a high-quality starter extension for your electric starter. Made of the highest-quality materials, this extension offers a long-wearing rubber

cup designed specifically to fit the X-CELL starter cone. It also has a two-bolt mounting design that tightly clamps the extension to the starter shaft for slip-free, true running.

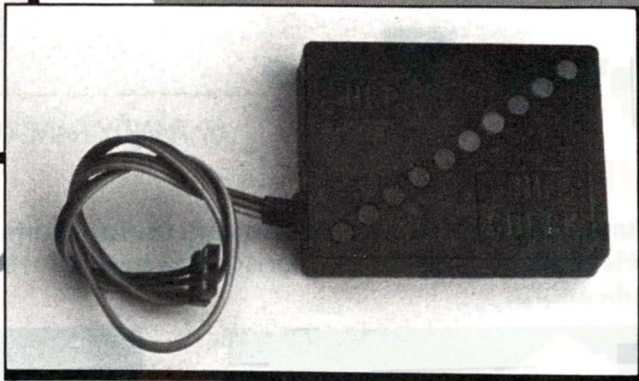


SR Batteries* manufactures the highest quality aircraft-grade batteries for every type of transmitter and airborne application. These batteries offer a large capacity for their size and weight. They can be supplied in any size, shape and capacity to suit your specific needs, and are available with connectors to fit any radio.

Futaba Corporation of America* is now distributing the YS line of engines for both helicopter and fixed-wing flying. Made with superior craftsmanship, they are available in airplane or helicopter versions with either side or rear exhaust. The YS line also features a unique, fuel-pressurizing system to ensure a steady fuel supply during any maneuver or flight attitude, and it's backed by the Futaba reputation for quality and performance.

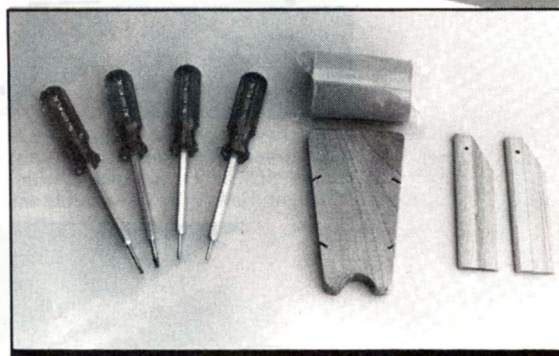


Custom Woodcraft* manufactures deluxe, wooden, field accessory boxes for both helicopter and fixed-wing flying. Pictured is its Flight Line unit, which holds power panel, battery, fuel, electric starter and towel rack. It has a small utility drawer, and is topped off with a well-balanced carrying handle. The large Flight Box (not pictured) offers all these features, plus folding legs that close up into one neat unit.



Paul Cross* manufactures an airborne battery checker that enables you to visually determine the charge state of your batteries. Weighing only 15 grams and consuming only 30mA of electricity, it employs high-brightness LEDs to display the battery voltage (under flying load) from 4V to 5.1V in increments of 0.1V.

Airtronics Inc.* has recently released its new Spectra line of PCM radios for both helicopters and fixed-wing flying. These radios feature all the bells and whistles any pilot could want, they're narrow band with the latest electronic technology and are available in the new 1988 frequencies.



Yale Hobby Manufacturing, Inc.* manufactures a wide line of accessories for helicopter enthusiasts. Shown here are its metric hex-wrenches with lifetime-guaranteed hardened tips, heat-shrink blade covering, wooden tail-rotor blades and wooden blade holder, which makes it easy to transport and store your helicopter.

**Here are the addresses of the companies featured in this article:*

Airtronics Inc., 11 Autry, Irvine, CA 92718.

Century Systems of America, Box 4085/R127, Costa Mesa, CA 92626.

Custom Woodcraft, 4 Pine Shadows Rd., McArthur, CA 96056.

Futaba Corporation of America, 555 W. Victoria St., Compton, CA 90220.

Miniature Aircraft USA, 2324 N. Orange Blossom Tr., Orlando, FL 32804.

Paul Cross, 77 Northfield Park, Soham, Ely, Cambs., England CB7 5AX.

SR Batteries, Box 287, Bellport, NY 11713.

Tech Specialties, 218 Vernon Rd., Greenville, PA 16125.

Yale Hobby Manufacturing, 3896 Selvitz Rd., Ft. Pierce, FL 34981.



Tech Specialties* manufactures many add-ons and accessories for your helicopter. Some of its products include a metal servo-tray set, as well as vertical and horizontal fins and clamps for the GMP Competitor or Cobra. Also shown is its loaded antenna and assorted hardware package.

How To:

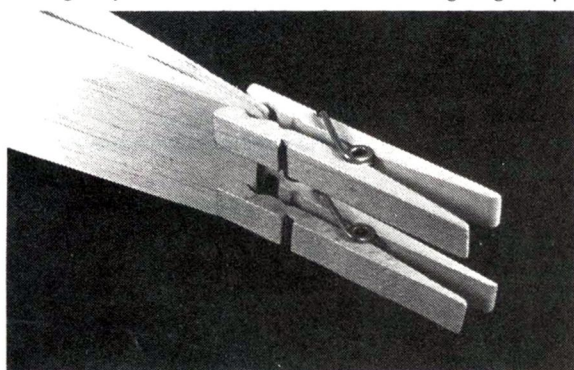
by RANDY RANDOLPH

CLOTHESPIN CLAMPS

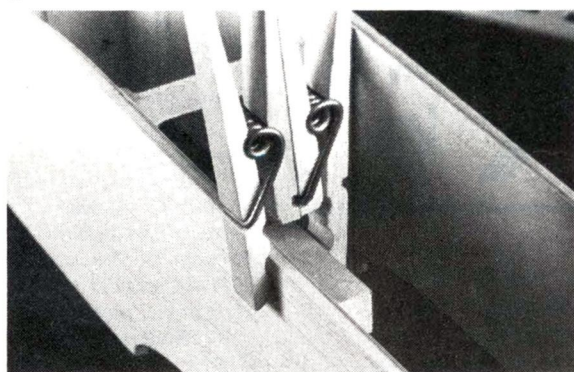
For a long time, clothespins have been a very useful addition to a modeler's tool inventory. Here are some modifications to this basic tool that come in handy for specific applications.



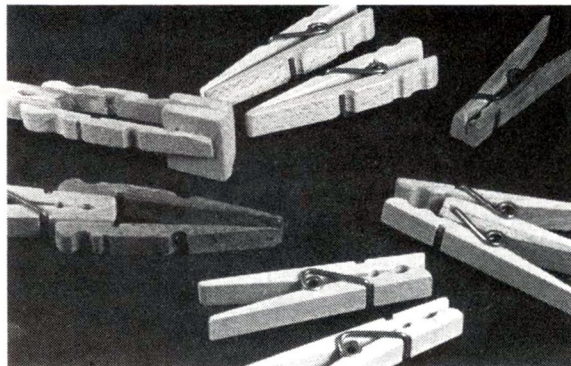
1. Clothespins come in several sizes, and the larger ones are the most useful. Select smooth, well-finished pins with shiny metal springs that allow the jaws to align properly when closed. Misaligned jaws will cause trouble when used as gluing clamps.



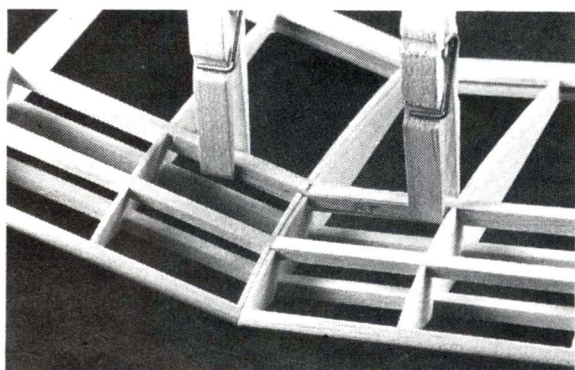
3. Standard, unmodified clothespins are great in places requiring clamping before or during gluing. In this case, they are holding the sides of a fuselage in alignment at the tail while the glue sets.



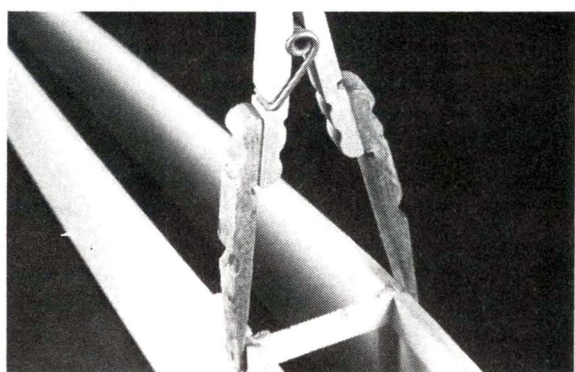
5. Compound pins will apply more pressure than reversed pins, and they can be opened to accommodate thicker materials. In this application, they are holding a birch-block wing mount to a fuselage side while aliphatic resin glue cures.



2. Clockwise from the top: reversed pins, snub-nose pin, compound-spring pin, unmodified pins, extended jaws and extended jaws with pads. All have a place on the workbench.



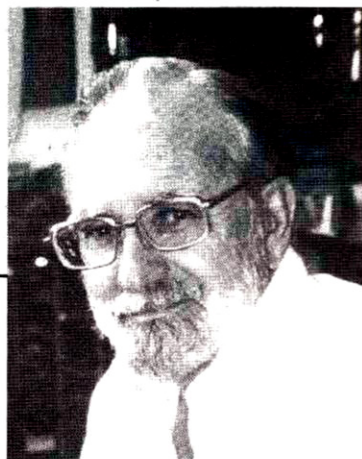
4. Reversed pins have longer jaws that are parallel when partially open and able to hold thicker pieces more easily. Here, reversed pins hold plywood dihedral braces in place on both sides of a wing spar.



6. The jaws of a standard pin can be extended by gluing half-pins to them with epoxy or slow CA. They can handle even thicker material or widely spaced parts. Here, they hold a fuselage bulkhead in alignment so CA can be applied. For more gluing pressure, compound pins can also be extended in the same way.

Small Steps

by RANDY RANDOLPH



IT'S TIME FOR a little philosophy! I'm *very* tired of listening to so-called intelligent people refer to our planes as "toy airplanes." Worse yet, this comment often comes from those within the sport, and even from some of our elected leaders. Regardless of how they laugh when they say it, or try to justify the term, these people are just *not* intelligent. If, by accident, you're reading this and you use this term, please go on back to your *National Inquirer*; these pages are for those who are *proud* of their sport.



It's sometimes difficult to maintain a constant needle setting on .049 engines after they've aged a little. Fuel tubing over the needle and the base helps to eliminate air leakage around the needle seat and results in a smoother run.

And another thing: Webster's dictionary gives numerous definitions of the word "model," but the only one that truly applies is: "worthy of emulation, as a model person." That's something else to remember, because *most*, if not all, full-scale aircraft existed as models before they were manufactured!

Those of us who build and fly smaller R/C airplanes know that we're the true cream of the R/C fraternity and we're proud of our work. Good, small airplanes aren't easy to build. The parts are small and difficult to handle; if they're not assembled correctly, your bird could turn into a brick. Not only that, but look at the glue joints on some of those bigger jobs; in a small airplane, those parts wouldn't even be in formation with the rest of the plane.

To build and fly a small airplane, attention must be paid to building a light, yet strong, construction, and also to

creating good aerodynamics and smooth non-binding control-surface response. None of these things just happens, yet thousands of us do it all the time. When someone comes up to you while you're flying your .10-powered bird and says, "You got a 40 in there?"—that's a kick the big ones never get. Pity!

Jeff Gromen is one who understands this, and he even signs his letter, "A Happy Modeler." He's looking for a good airplane he can scratch-build for his Cox* QRC. So far, he's been successful with a Super Pronto, a Real Sporty and an Eaglet. Jeff is 16 and the kind of person Webster described in the definition given earlier!

Speaking of 16, the next letter is from someone who started modeling at that age. Bob Paris now lives in Seward, AK, and he's been a solid member of the SAS (Small-Aircraft Set) since way before his tour as a service helicopter pilot from 1965 to 1970. Bob is an A&P-rated line captain and Director of Maintenance for a major airline. He sent kind words about an .049-powered Schoolgirl as well as a Skylark, a Jr. Falcon, a Scimitar and the ever-popular QT.



Marking ribs for trimming is easy with this lash-up.

Bob writes: "...The QT was pure pleasure. I flew it on three channels using Kraft KPS-18 servos, a sleeve throttle and Trexler tires. Using a 2-ounce tank, I would taxi out, take off, fly up a storm, land and taxi back. I flew that model for four years and for over 600 flights. The older that Cox .051 got, the more power it put out. All I ever did was reset the piston and rod and clean the little holes in the carburetor.

"I've built a couple of Skylark Twins and powered them with O.S. .10s. In fact, I once turned a Skylark kit into a four-engine, triple-tailed Super-6 Connie look-alike—O.S. Max .10-powered, of course...."

Now, friends, *there's* a project for next winter if ever there was one!

The maintenance on Bob's Cox engine requires a reset tool, and you can buy one from Kustom Kraftsmanship*. All owners of the Cox .049-.051 engine should have one. In time, the ball-socket joint between the piston and the rod on Cox engines will loosen. The reset tool corrects this situation and brings new life to the engine.

While thinking of tools: if you send two dollars to Ace Radio Inc.*, they'll send you their new catalog. These people have been the friends of smaller airplanes for 35 years! The throttle sleeve on the TD and the engine mount in Picture No. 1 came from Ace. One of their fine thread-needle valve assemblies would have negated the need for the fuel tubing.

Picture No. 2 shows a slick way of marking ribs when they need to be trimmed to accommodate sheeting. A strip of balsa is taped to a fine-tip pen and used as a guide along the edge of the rib while the pen makes the mark.

The old duffer in Picture No. 3 is the fumble-fingered half of the team that puts this "Small Steps" column together every month! Some of you wonder just what this pair looks like. Well, I'm the pretty one!

I think we've finally put it together, so here's some advance information for you calendar-markers. The First Annual Model Airplane News Small-Scale Fly-In is scheduled for November 5 and 6 in Dallas, TX. It will be a fun-fly rather than a contest, and we hope to have something

(Continued on page 64)

TOP FLITE



Photos by Rich Uravitch.

**New Size, New Look, New Generation,
Old Reliable...**



HEADMASTER

by STEVE SCOTTO

CAN YOU REMEMBER the first time you saw an R/C model fly? For me, it was over 20 years ago, at a grass field late on a summer day. My uncle Mario started the tiny .049 engine and shooed us kids away. He worked a button on the face of a home-built transmitter, making sure the rudder responded. Tests completed, he launched the tiny

airplane with a powerful heave. The plane buzzed aloft, nudged into a loose circle around the field by the obedient rudder. The landing may have involved a tree, but I still remember the excitement of seeing a model airplane fly, controlled from a metal box in my uncle's hand.

That tiny plane was called the Schoolboy, and I've since

found out that it was the design of Ken Willard. Constructed solely from balsa sheet, it was strong and easy to build with slow-drying Ambroid cement. Though it was square and boxy, the tall, swept vertical fin gave it a jaunty look that I've never forgotten.

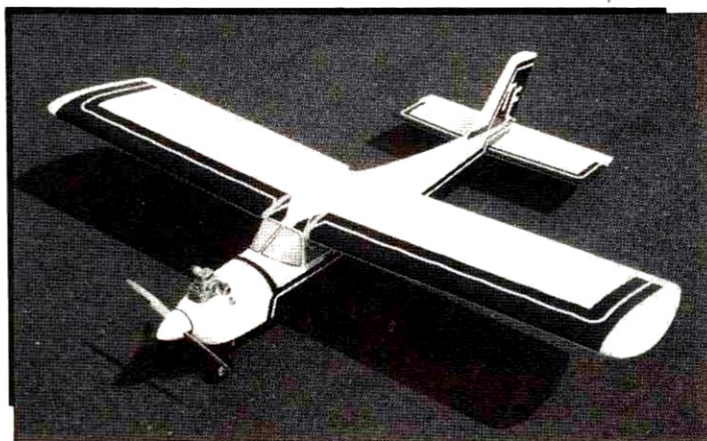
Now you can imagine how exciting it was for me to see the Top Flite* Headmaster 40. The tiny plane of 20 years ago has grown to a respectable 59-inch wingspan with three wheels and 4-channel control. The biggest news? This is an ARF model, simple and strong enough for any beginner.

This plane is quite similar in design to kit-built airplanes. The fuselage is a sturdy, poplar, plywood box, and a plastic cowl and windshield soften the lines up front. The wing combines balsa ribs and spruce spars. The rudder is simple sheet balsa, retaining the cheerful sweep that marks Ken Willard's classic design.

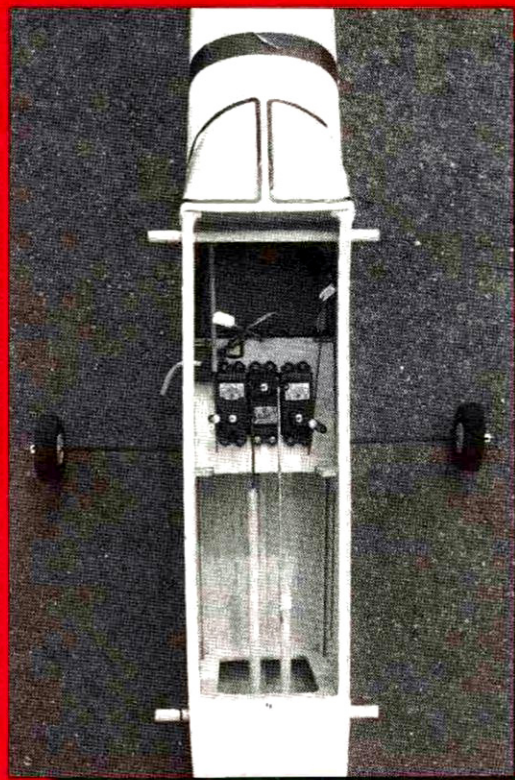
The fuselage, wing and tail surfaces are all covered with a pre-painted adhesive plastic film. Control surfaces arrive covered, and holes are pre-drilled to accommodate pin-type hinges. All hardware is supplied, including the engine mount, fuel tank, landing gear, wheels and all necessary pushrods. Also included is a well-illustrated, 14-page construction pamphlet. Radio installation is only vaguely covered, so a beginner *must* seek help from an experienced modeler!

CONSTRUCTION: When building the wing, three die-cut plywood pieces are first glued together to form a wing joiner. This joiner slides into a box built into the root of each wing. Test-fit the joiner, and make sure the wing halves fit together snugly *before* you glue them! The joiner in my kit needed to be shortened about 1/4 inch. Five-minute epoxy is a good choice for joining the wing. It'll give you enough time to ensure good alignment of the wing halves.

The ailerons are hinged with one-piece molded hinges. These hinges come out of the box a little stiff, so bend them back and forth a few times to loosen them up. Some modelers snub the one-piece-style hinges. They're afraid that the hinge will break after repeated bending. I subjected the hinges to some tortuous and, admittedly, unscientific testing, but I



Pre-decorated upper wing surfaces with undecorated lower surfaces help solve beginner orientation problems. Attractive airplane, good proportions.



Radio compartment is generous, to say the least. Ideal for beginner to learn proper equipment installation

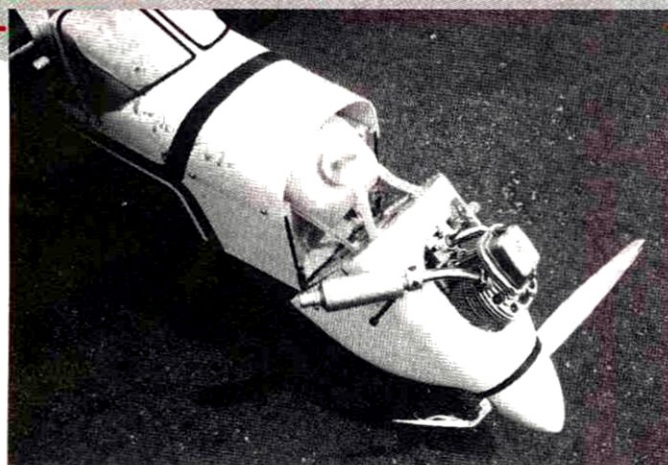
couldn't rip one apart. Use epoxy to glue the hinges into the wing trailing edge and aileron. At this point, you might as well hinge the stab and rudder, as long as you're in a hinging mood.

The next step involves attaching the stab and rudder. Gluing the parts on is quite simple. Doing it *right* is a little more demanding; doing it right means making sure the stab is centered and square to the fuselage, parallel to the wing and firmly glued with a wood-to-wood joint. The instructions provide clear directions and diagrams; follow them carefully.

To install the engine and fuel tank, screw the engine mount into place, and put the engine on the beams. With the backplate mounted on the engine, measure 4 1/2 inches from the fire wall to the back of the spinner plate. Mark the position of the mounting holes on the engine mount with a felt-tip pen and remove the engine. Drill 1/8-inch holes at your marks, and bolt the engine into place. Small blocks are now glued in place on the front of the fire wall; these hold the cowl in place. The cowl must be cut away to allow room for the cylinder to protrude (as well as the needle valve, the nose gear and whatever else you like to have access to). A Dremel tool with a sanding drum is the perfect tool here.

Finishing the model includes attaching the landing gear, trimming the windshield and plumbing the fuel system. Radio installation is straightforward, but if this is your first time, get advice! If you *must* go it alone, make sure that you do the following: Pack the receiver and battery pack in foam. Securely attach the servos. Check that the controls move in the correct directions. Make sure the pushrods move freely and don't bind the servos.

HEADMASTER



Fuel-tank installation unintentionally discovered by careless pilot. Rugged airplane, no damage, five-minute repair.

Move the controls from one end to the other and listen carefully for buzzing or clunks that indicate problems. If there's a problem, fix it! "Good enough" doesn't work on R/C trainers.

I chose the Enya* .46 4-stroke for this model. This little jewel of an engine is quite compact, and fits well in a space designed for the more compact 2-strokes. This airplane may not hang on the prop, but there's plenty of power for a beginner. All-up weight of the Headmaster totalled less than six pounds which, when distributed over the generous area of its 59-inch span, provides a comfortable wing loading of less than 20 ounces per square foot; quite acceptable for a trainer-type, high-wing airplane.

PERFORMANCE. Conditions couldn't have been better when I took the Headmaster to the field. Perfect sky—just a breeze and even that was straight down the runway. I did a final pre-flight check, filled the tank and fired up the Enya, which immediately settled back into the 4-cycle idle that I've come to enjoy. Lining up on the runway, I advanced the throttle and, in short order, the Headmaster was airborne and climbing out smartly. No doubt about it—power to spare! After flying around a bit to get the feel of it, I tried a few basic maneuvers, including figure 8s, procedure turns and stalls—all things the beginner should home in on early in his flying career. The Headmaster does all these quite well. Landing approaches can be made very precise, as the airplane responds quite nicely to both elevator and throttle inputs.

The second time out, I did pretty much the same thing; the only difference was that the wind was blowing at about 20kts. Certainly not ideal for a learning environment, but it did provide the opportunity for

some expanded testing. The Headmaster didn't seem to be terribly bothered by the wind, except when I got it too slow, too low, lost the engine and caught a gust of wind at precisely the same instant. Ever wonder what the inside of one of these ARFs looks like? The Headmaster rewarded my ham-handedness by dropping on the nose gear extremely hard. The impact yanked the fire wall out, but did no other damage. Close inspection revealed that there was no structural damage; only a glue-joint separation, almost as if by design, to accommodate the abuses of the new (or dumb) fliers. After an easy repair, I was out logging some more time. To date, 14 flights have been accumulated on the Headmaster; some of them by the very novices I think will appreciate the ability of

SPECIFICATIONS

Type: ARF Primary/Intermediate trainer

Span: 59 inches

Weight: 5 pounds, 13 ounces

Area: 714 square inches

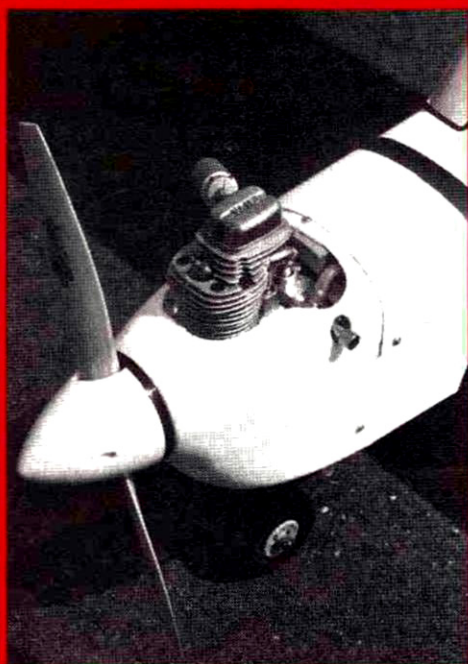
Wing Loading: 19.3 ounces/square foot

Power Req'd: .35-.45 2-cycle, .40-.55 4-cycle

No. of Channels Req'd: Four

Suggested Retail: \$249.95

Features: Conventional construction and materials. Pre-covered with colored heat-shrink Mylar. Complete hardware package, including engine mount, tank, wheels and hinges.



Enya .46 4C provided more than enough power. Ran great. Ultra-safe needle-valve location typical of 4-strokes.

this airplane to serve them well through the early phases of their training. Although my first R/C experience was a long time ago with a different-size Headmaster and different equipment, some good things never change. Uncle Mario would appreciate that!

**The following are the addresses of the companies mentioned in this article:*

Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616.

Enya Model Engines, P.O. Box 286, Fords, NJ 08863.

RAINBOW RUNNER

(Continued from page 30)

stringers), triangle stock and plywood formers. Basically, you simply glue the stringers and tri stock in place and then mark the location of the formers before joining the two sides. I usually make everything as a unit and then drill out the fire wall to fit the motor, but not here! The Rainbow Runner has a very sleek nose, and to stop yourself from putting a bunch of holes in it, you'd better fit the engine mount and make the access holes *before* completing the fuselage. In other words, you can rely on the provided instructions.

While building the fuselage, you'll notice that the wing location is almost a mid-wing position. Of course, this indicates that the ship will have good axial roll capability. It also means that just a little more building is required at the wing saddle. On the Rainbow Runner, this is made quite simple with the use of sub-formers at the rear of the wing saddle.

The top of the fuselage is open. Here, I placed a number of half-size formers to support the large turtle deck. The only tricky part here is the former that also forms the rear of the cockpit. If you simply place the fuselage side against the plans and then glue the former in place,

you'll get the correct angle. After this, the turtle-deck sides and top were glued in.

At the nose, you'll find a pre-drilled fire wall. Attach the motor mount and the nose steering bearings. Make sure that you do a good job initially, because it will be difficult to adjust them later on. When you're satisfied with the fit, glue the nose blocks to the front. (These are large balsa blocks.) You must cut a clearance hole in the lower block to allow the steering block and the nose gear to exit. After this, it's time to sand! Don't be shy with this; the Rainbow Runner has plenty of meat to trim away, and careful sanding will result in a very nicely contoured aircraft.

The wing is next, and this is a very strong Modified D-tube structure. I don't ever recall seeing a wing as strong as this in an aircraft of this size. Wing construction begins with laying down the lower main spar and trailing edge. Placing the spar on the plans, mount the ribs on top of the spar, sans glue. Without glue? Yup, they fit without glue, as the fit is absolutely precise. You can position *all* the ribs and then hit them all with glue. Glue them to the trailing edge, add the upper spar and trailing-edge sheeting, and you can then remove the wing from the plans. It

took me slightly longer than 20 minutes to frame up each wing half.

The ribs are reinforced with shear webs all the way to the wing tip, and this makes for one strong spar assembly. Ensure that the wing is straight and true *now*, because if it's warped, it will be difficult to straighten it later. Now add the lower wing sheeting and the landing-gear blocks.

The ailerons utilize a standard bellcrank linkage coming from the center section to the wing midpoint. The hardware and bellcrank mounts are installed at this time, and you should make sure that the linkage is slop-free as well as easily moved. When you're satisfied with this, the upper sheeting is added, followed by center-section sheeting and wing tips. Sand the wing to shape, and then join the wing halves.

The main gear installation is noteworthy. The gear wires and fastening straps are countersunk into the wing sheeting to make a clean wing surface. This is a nice touch, and it shows that the designer went the extra mile to ensure the production of a top performer. The wing fairing is now added to the bottom of the wing; this is best fitted after the wing has



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RAINBOW RUNNER

been attached to the fuselage. Remember where the wing bolts are located, because the wing fairing goes right over them and you must cut holes in the fairing to get them back later on. I cut the holes just large enough for the screwdriver, but not so large that the bolt falls out. In this way, I have a semi-captive wing bolt.

At this point, we have a rough airframe that requires only a final sanding and finishing. As previously mentioned, careful sanding is important. There's no danger of sanding through the skin in your attempt to get a nicely rounded contour, and you can shed any unwanted weight this way.

The kit provides adequate instructions for the installation of retracts. The plans show Goldberg* retracts installed in the wing and nose, but you can use other makes if you prefer. If you choose pneumatic retracts, there's plenty of room in the fuselage for an air tank.

I finished my Rainbow Runner with Super MonoKote from Top Flite* for a light, easily maintained finish. The powerplant is an O.S. Max 40 FP from Great Planes*. This engine is a Schneurleported design with plain bearings, and it's

suitable for most sport applications. I'll discuss this engine later.

The radio is the Futaba* Conquest 4-channel, using standard S-38 servos and a 500mAh pack. This fits comfortably into the fuselage, leaving enough room for about three more servos. All-up weight is about 4.5 pounds, and no additional weight was needed for balance, as the Rainbow Runner came out right on the spot called for in the plans. Add some polish and pictures, and off to the field we go.

PERFORMANCE: The Rainbow Runner turned out to be a good-looking plane, but flying is what it's all about. We fired up the 40 FP in no time, and, with a little adjustment, we soon had it purring away. After a long taxi down the runway, I pointed it into the wind. It lifted off within 75 feet of rolling, requiring only a click of elevator trim. First impression? Nice birdie we have here!

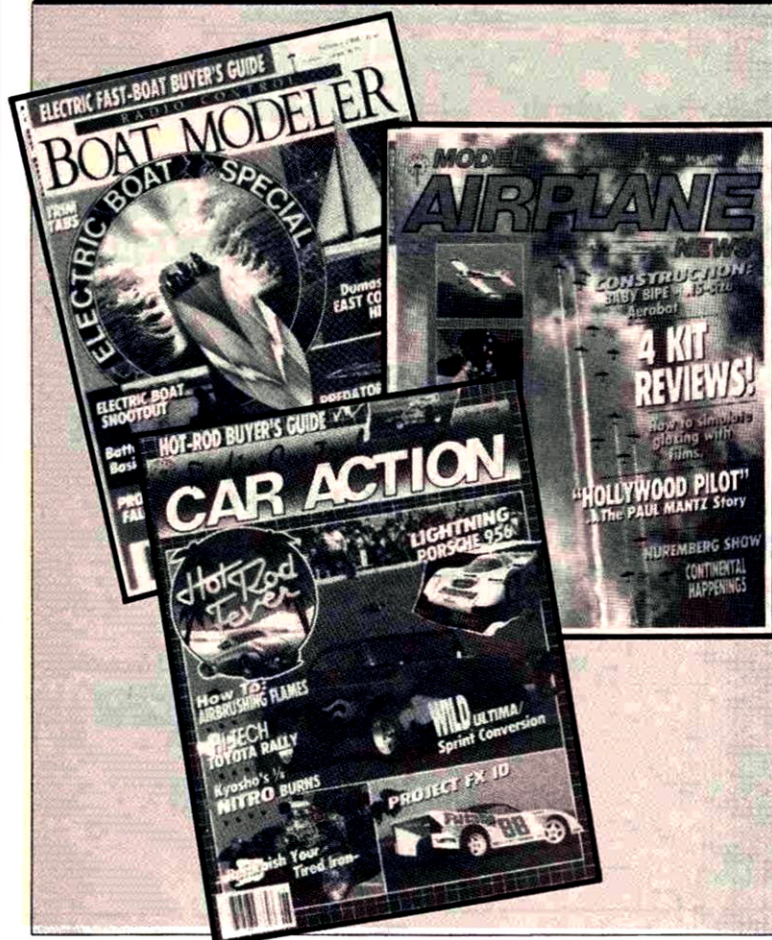
Because this aircraft is made to turn and burn with a 45-size engine, I admit that the 40 FP is a little too docile for it. A hot 45 wouldn't be too much for the Rainbow Runner. The Max 40 FP handled the plane very well, giving a performance

that would keep many pilots quite content. Handling is very solid, with good aileron response and very quick elevator response. Rolls are crisp and axial—true to the almost mid-wing design of the ship. Pitch control, although quick, is positive, without wallowing or slop. Rudder response is good, and it provides enough authority for sustained knife-edge flight and easy stall turns.

Landing the Rainbow Runner is very different! With the double-tapered-wing design, I expected tip stall at low speed. However, this didn't happen, as the Rainbow Runner will easily drag its tail all over the runway before settling down on the mains. It remains solid right down to the ground. Inverted flight goes quite well, as do point rolls, slow rolls and outside loops. As the manufacturers claim, the Rainbow Runner is pattern-capable.

As a mid-size pattern bird, the Rainbow Runner performs well. It displays all the desirable handling characteristics of a full-size pattern bird, and it does so without complaining. The structure is very strong, so it should withstand hours of stressful flight, and it's very capable of

(Continued on page 64)



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The robbe ASW 24 is a giant scale model of the newest Standard Class design from the world's leading sailplane manufacturer, Alexander Schleicher in West Germany. It features not only the latest double trapezoid wing geometry for optimum lift distribution, but also the famous F3B proven Quabeck HQ-3.0/13-10-13 airfoil for exceptional performance and wide speed range. Any R/C pilot will enjoy the non-critical stall characteristics and well balanced rudder response.

The kit includes highly prefabricated components, such as the white Plura® fuselage, balsa pre-sheathed foam core Siros® wings, stabilizer, all hardware, and even a cockpit interior insert with pilot figure. No special skills or power tools are necessary for completion. Building time is as short as one weekend. Wing span 138 in.



SUPERMAX ▲ (Order No. 3118/3119)

Who says aerobatic trainers have to look ugly? While the sleek lines of the robbe SUPERMAX remind you of a full-scale airplane, it was designed to be a high performance but docile trainer. A .46 four-stroke or .50 two-stroke engine provides ample power to perform any aerobatic maneuver.

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RAINBOW RUNNER

(Continued from page 62)

flying with the hottest 40- to 45-size engines, (including piped engines). The kit is of top-notch quality and is complemented by a superb instruction manual and plans. The O.S. Max 40 FP handles the ship well, although it's on the tame side. The Futaba Conquest operated flawlessly. I couldn't find any major flaws in this good-value model. Pattern performance from a mid-size ship? The Rainbow Runner fits the bill.

*Here are the addresses of the manufacturers mentioned in this article:

G.M. Precision Products, Inc., 510 E. Arrow Hwy., San Dimas, CA 91773.

Satellite City, P.O. Box 836, Simi, CA 93062.

Carl Goldberg Models, Inc., 4734 West Chicago Ave., Chicago, IL 60651.

Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616.

Great Planes Model Distributor, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820.

Futaba Industries, 555 W. Victoria St., Compton, CA 90220.

SMALL STEPS

(Continued from page 56)

commemorative for all participants. We'll remind you as we get closer to the date, but in the meantime, contact me for additional information: Randy Randolph, P.O. Box 271048, Dallas, TX 75227.

*Here are the addresses of the companies mentioned in this article:

Cox Hobbies, Inc., 1525 E. Warner Ave., Santa Ana, CA 92705.

Kustom Kraftsmanship, P.O. Box 2699, Laguna Hills, CA 92654.

Ace Radio, Inc., P.O. Box 511, Higginsville, MO 64037.

JET BLAST

(Continued from page 33)

increased weight. In an airplane with an all-up weight in the 8- to 9-pound range, the Turbax I is a great choice for the sport flier.

F-19!

One of the fascinating aspects of ducted-fan involvement is directly related to the "newness" of the subjects we choose to model. These pages have shown you jets that have traced the lineage of real jets in model form from the F-80 right up through the F-15s, 16s and 18s of today. What's next, you ask? The logical expansion of the progression would tell you F-19, right? Bingo! Although the Air Force hasn't even officially acknowl-

(Continued on page 68)

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MAN 9



5000 spectators, over 125 jets, and weather got together for a FANTAS

by RICH URAVITCH



Photos by Rich Uraivitch



Awesome aviatin'. Yellow Airplane Company's prototype wing-swingin' F-14A with twin Dynamax fans driven by O.S. 77s. Matte black Playboy finish existed on real bird...for a day or two!!

IGUESS MOST OF YOU have heard of the meteorological phenomena called the Siberian Express, the jet stream, the Gulf Stream and cyclonic flow—right? What if I told you that *all* of these, as well as others without names, converged on

Canada's otherwise-peaceful Bay of Quinte area for one of the two days of the 1988 Jet Rally? Well, it happened but, while it did curtail some of the flying activity, it sure didn't diminish the interest or excitement.

An estimated 5,000 spectators came to watch 66 pilots fly their jets during the two-day fun fly. No contest pressures—just a good old get-together, “fly ‘em if you got ‘em” laid-back attitude. Over 120 ducted-fan-powered airplanes were on hand. Many had been built from kits, but a large number had been scratch-

Some periods of strange
Canadian weekend!

Not a misplaced photo!
Hal Parenti's beautifully
executed Ryan FR-1
Fireball. Model duplicated
mixed-propulsion package
of real airplane by using
Kress RK-740 as jet
portion.



Absolutely the prettiest sport
jet at the meet; Eric Baughner's
Violet Viper attracted lots of
attention. Flew very well and
fast, in spite of Sunday's wind.



Partial view of pit
area has Yellow
Aircraft A-4
Skyhawk in
foreground,
Parkinson Regal
Eagle, Byron F-16
and others behind.

designed and built by modelers from
all over North America. Of the 66
registered fliers, 47 were American
(that's us), and 19 were from the
host country. If nothing else, that
provides a pretty clear indication
that a lot of US fan fliers are
willing to travel real distances to
partake in fan activities.

This was the third consecutive event,
and it shows all the signs of becoming an
annual thing. Attendance is up, participation likewise,
and it's easy to see why. The host club goes all-out to
ensure that everyone has a good time. With the blessing of the

(Continued on page 70)

JET BLAST

(Continued from page 64)

edged the existence of this stealth-technology fighter, let alone released any drawings of it, Testors/Italeri put out a plastic kit a couple of years ago that was supposedly based on a compilation by those close to the project. Ralph Saldivar, a modeler of note from Fresno, CA, used this model to develop a plug from which he will produce a mold that will yield fiberglass fuselages for an R/C F-19. Ralph's experience with R/C jets goes back over 20 years, when he successfully flew an R/C Dynajet-powered U-2. He's presently preparing the F-19 for flight testing and has promised *Model Airplane News* "right of first refusal" of the design if the project is successful. Keep your fingers crossed!

Address Change

Larry Epifanio, owner of Southeast Model Products*, has relocated his kit and fan business to Deland, FL. For newer readers, Southeast is the source of the Aerojet 25 fan unit, which is an upgraded version of the original Midwest RK-20, designed by Bob Kress. Larry also has a

pair of kits available from the Nick Zirola design stable: the F-4 Phantom and F-15 Eagle. Both kits will accept the Aerojet 25 and the Kress* RK-740. Contact Larry for further information on any of his products.

That about wraps up this installment. If you have any questions, points of view or information to share, send it in, and I'll try to use it.

For peak performance, stay tuned!

*Here are the addresses of the companies mentioned in this article:

Nick Zirola Models, 29 Edgar Dr., Smithtown, NY 11722.

Bob Violett Models, 1373 Citrus Rd., Winter Springs, FL 32708.

Yellow Aircraft; Hobby Supplies, Ltd., Suite 201, 3040 Palstan Rd., Mississauga, Ont., Canada L4Y 2Z6.

Byron Originals, P.O. Box 279, Ida Grove, IA 51445.

MDM, P.O. Box 739, Rancho Murieta, CA 95683.

Jet Model Products, 304 Silvertop, Raymore, MO 64083.

Turbax; manufactured by Jet Hangar Hobbies, 12130 G. Carson St., Hawaiian Gardens, CA 90716.

Southeast Model Products, 14325 60th St. N., Clearwater, FL 34620.

Kress Jets, Inc., 4308 Ulster Landing Rd., Saugerties, NY 12477.

1/8 AIR FORCE

(Continued from page 46)

Later, at home, I calculated the wing loading on Gene's P-38; it's 70 ounces to the square foot! So much for wing loading! Bert Baker, it's too bad you couldn't be there to see Gene's flight, because that one flight made all your fine design work worthwhile.

Both Brian O'Meara, with his Scale Flight P-47 and Denny DeWeese, with his Lien* FW-190, made one smooth flight after another all weekend. However, even more impressive than their pretty flying, was the way they got their gear up as soon as they were solidly airborne. This is scale, and it looks so good. Regrettably, many pilots flying World War II fighters and jet fighters wait until the plane is high in the air and long gone before they pull the gear up.

(Continued on page 74)

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Bob Fiorenze's F/A-18 Hornet returned this year, to the delight of the numerous spectators. Bob has a new, precision scale version ready for the Scale Masters.



Cressline F-20 in Paris Show finish was displayed but not flown. Typical of high quality of jets at meet.



Byron Originals F-16 in "box-stock" T-Bird livery. Built by Bob Relie; nicely done.



Above: Dave Latsha's Viper is beautifully finished, colorfully decorated and highly visible.
Left: Part of the Yellow Airplane Company ground-support crew readies one of their F-15 Eagles for a mission.

(Continued from page 67)

base commander, they secure an entire Canadian Forces air base, enlist the services of the Canadian version of our Civil Air Patrol to help them manage the affair, keep the food and beverage stands functioning and do an all-around terrific job.

They only thing they haven't managed to control is the weather, but I hear that they're working on that, too. During each of the past three years, at least one of the two flying days has been cut short by adverse



Probably not wanting to show service favoritism, Bob Relie also built this Byron A-4 with Blue Angel markings.

BAY OF QUINTE FAN JET RALLY

One of many A-4s present; this one by Scale Masters competitor Dennis Crooks. "Civilianized" Skyhawk looked sharp.



weather conditions. This isn't the mild stuff that doesn't affect the model jet drivers, but serious, heavy-duty 40- to 50-kilometer winds and tornado watches! Maybe next year!

Contest director for the past two years, Joe LeBoutier, turned over the reins to Peter Sant due to a new job assignment, but he just couldn't stay away and showed up as a participant, flying one of the many Yellow Aircraft Company* A-4 Skyhawks. Another "Yellow" A-4 was flown for about seven seconds by our buddy Butch Rosser, who came all the way from Ohio, as he says, "to fly, not spectate!" Butch's Skyhawk bought it just after takeoff when one of the frequent "microbursts" grabbed it and pushed it back to the concrete.

One of the prettiest and, without doubt, one of the fastest sport jets was the beautifully built and finished Bob Violett Models* Viper of Eric Baugher, who also brought his Violett-powered sport-scale F-4 Phantom. Eric's Viper is shown in our lead photo. Also on hand to represent the Violett camp were Dave Latsha with his colorful jet, dubbed "Latshark," and Ms. Stick, Patti

Violett, who spent most of her time extolling the virtues of her dad's products. Tom Cook, of Jet Model Products*, flew a new Starfire II from his kit. This version was finished in a military-style camouflage scheme that really created a totally different look for this rapid jet.

Bob Parkinson*, head of the kit company bearing his name, brought along a number of his Avros, Blue Hornets and Regal Eagles, one of which was powered by his own newly developed fan unit. Bob claims that the plane doesn't need a muffler because of the engine exhaust's proximity to the rotor, but it seemed louder to me than anyone would want, especially given the prevailing sensitivity to noise. Bob also reports that there have been some delays in shipping the fans, owing to a shortage of the blades he uses to fabricate the rotors. His recent move to new, larger facilities has been accomplished, but has also created some additional delays in shipping kits. Should all be sorted out by now!

The two-man Sky Riders demo team, consisting of Terry Malcolm and Karl Hibbs, pleased the crowd with its matching Byron* Bullets, and, in spite of the sometimes fierce wind, did a great job. If you're waiting for a kit review of the Byron F-20 Tiger Shark, we should soon have a Field and Bench review from Karl. He's been flying Byron jets for a long time and probably knows more about them than most of us.

Speed merchant Art Arro flew his "15-year-old technology" special JHH* (formerly Bob Violett) A-4 Skyhawk powered by a Turbax I running a hopped-up K&B* 7.5. Art's point was well taken. Properly set up and maintained, some of the earlier equipment still works well. The Navy Aggressor-finished Skyhawk performed well and gave away very little in visual performance to some of the more contemporary, state-of-the-art-powered machines.



Tom Cook's own JMP Starfire II in military-style camouflage. Creates a whole different look from the sport finishes usually seen.

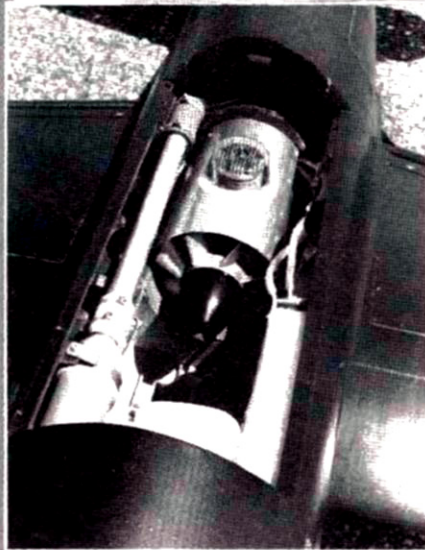


Looking lethal, Bob Fiorenze's F-5E uses single Dynamax/O.S. .77 and is a great performer. Probable future kit release from Yellow Aircraft.



CF-101 Voodoo by Ian Ward; Viojett power; fifth-place winner in our MAN "Great American R/C Design Contest." Construction article forthcoming.

Just before touchdown, Sky Riders demo team Byron Bullet gently raises nose to bleed off airspeed.



Above: Superior airmanship here!! Lowest knife-edge I've ever seen; only lasted a split second though. No serious damage to Skyhawk.

Left: Kress RK-740 installation in Hal Parenti's Ryan Fireball. Fan tank at right; recip engine exhaust pipe to left.

Without a doubt, the biggest crowd pleaser was the black F-14 Tomcat brought by the Jack Tse/Yellow Aircraft Company organization. Bigger than last year's version, this one flew much more smoothly and was even more impressive than its predecessor—if that's possible. Don Kinch flew the big 'cat extremely well on both Saturday and Sunday. The decision to fly it in Sunday's wind surprised me, especially as the wind was gusting at about 45 degrees to the runway. After completing the flight, Don skillfully touched down, only to have the wind blow the plane onto its back during taxi. The damage could have been a lot worse, but it really was a shame that it happened at all.

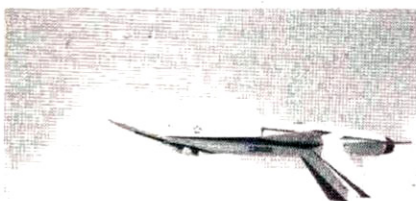
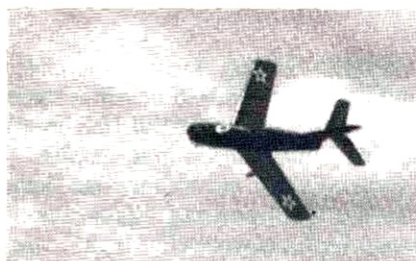
The rest of the Yellow Aircraft fleet was on hand throughout the weekend and included a prototype F-5E Tiger II flown by Bob Fiorenze, who also flew his impressive F/A-18 Hornet. Twin-Dynamax-powered F-15 Eagles shared ramp space with some SR-71s, a fiberglass fuselage for a forthcoming F-111 Aardvark, a proto Mirage F-1 and two pre-production flight-test models of a Dynamax-powered F-16 Falcon. This was the first public showing of the Yellow F-16; the

examples were a little rough because of some design problems that will, no doubt, be sorted out by the time the kit is released. The company has an energetic kit-release schedule planned, and it includes all of the above as well as a single-engine F-4

Phantom, plus who knows what else? Every year, they surprise us.

Every R/C gathering has minor glitches, and this year, as well as weather problems, frequency control

caused some difficulty. It didn't cause any incidents, accidents or crashes, but it did affect the length of flying time. The problem was probably partly caused by allowing the use of the "old" (not channel-numbered) frequencies, coupled with the fact that a lot of the fliers simply had their radios on the same frequency. Heaviest usage in the channel 38 through 44 area created a radio "log jam." This is a problem we'll probably have to live with until there's a more widespread distribution of radios on the other approved channels.



Two fly-bys; conventional done by Byron MiG, high-speed inverted by Firenze F/A-18 Hornet.

This was a great, well-attended fan meet, and plans are already underway for "Quinte '89." They do things right in the Great White North; excellent facility, great hospitality, a commemorative plaque for every participant and lots of camaraderie. If you're interested in fans, try to be there next year.

*Here are the addresses of the companies mentioned in this article:

Yellow Aircraft Company, Suite 201, 3040 Palston Rd., Mississauga, Ontario, Canada L4Y 2Z6.

Bob Violett Models, 1373 Citrus Rd., Winter Spring, FL 32708.

Jet Model Products, 304 Silvertop, Raymore, MO 64083.

Bob Parkinson Flying Models, 3 William St., Thornton, Ontario, Canada L0L 2N0.

Byron Originals, P.O. Box 279, Ida Grove, IA 51445.

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1/8 AIR FORCE

(Continued from page 68)

They deprive us of one of the greatest sights in scale flying; let's all work on it—I am.

At the noon break on both days, the pilots were asked to stand by their planes on the runway so that they could answer questions from the spectators who came out to inspect the models. This is always popular and generates a great deal of enthusiasm.

Apparently, Kent Walters has now worn out two O.S. 90s in his venerable, but still beautiful, 10-year-old SBD Dauntless. That must be the explanation for the engine problems that plagued him at the Scale Masters and at the Fly-In. He eventually got off with a good engine run, dived in from about 1,500 feet and laid that bomb right on the runway center line—where else?

Last year at this meet, Buzz Watson flew a very small, very detailed, full-house Bellanca four-place general-aviation plane. This year, he brought a very small, very detailed, full-house P-47,

patterned exactly after the P-47 that Bob Frey built from Holman* plans. Buzz's P-47 flew well on its .09-size engine. We couldn't figure out how he got everything (including flaps and retractors) into that small plane. It was generally agreed that Buzz's P-47 would have been competitive at the Scale Masters.

There's an interesting story about Bob Frey's 62-inch span, 60-powered P-47 built from the Holman plans. He built it specifically for the '87 Scale Masters with one purpose: He wanted to prove that a technically obsolete (too small) model could be competitive in the Scale Masters. With a combination of excellent static and flying scores, Bob placed seventh in a very competitive field of 60 fliers. What's even more impressive is that he did this while flying airshow-style maneuvers. Bob wrung it out even more during this Fly-In.

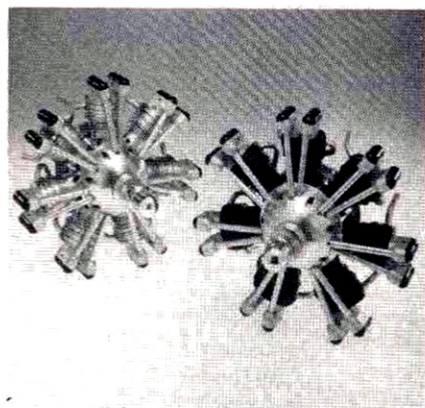
No scale get-together is really complete without Col. Bob Thacker, and Bob was there—as he always has been—this time flying a single-engine F-4 Phantom.

As always, Bob has a new plane under construction, which he'll unveil at some large meet and surprise us all. He's one of the truly grand pioneers in R/C scale.

Chuck Collier put in only one flight with his Q-50-powered Byron Beech Staggerwing, but what a fine flight it was; fast, smooth with large, sweeping maneuvers and quite realistic sound. This Staggerwing is even prettier than the one he flew into a big rock at Byron's Bash two years ago while formation-flying with my DeHavilland Hornet. We were sorry that he didn't feel well enough to fly more.

Mike Scott's magnificent Jet Model Products* F-4 Phantom caught everyone's eye. It obviously captured the attention of the spectators, too, because they voted it the "People's Choice" award. This is no "Hangar Queen," because Mike flew it several times, even after one engine sagged badly on the first flight and put him into a tight situation. Mike is in the Navy at San Diego and works on F-4s, so he has many authentic extras on

(Continued on page 84)



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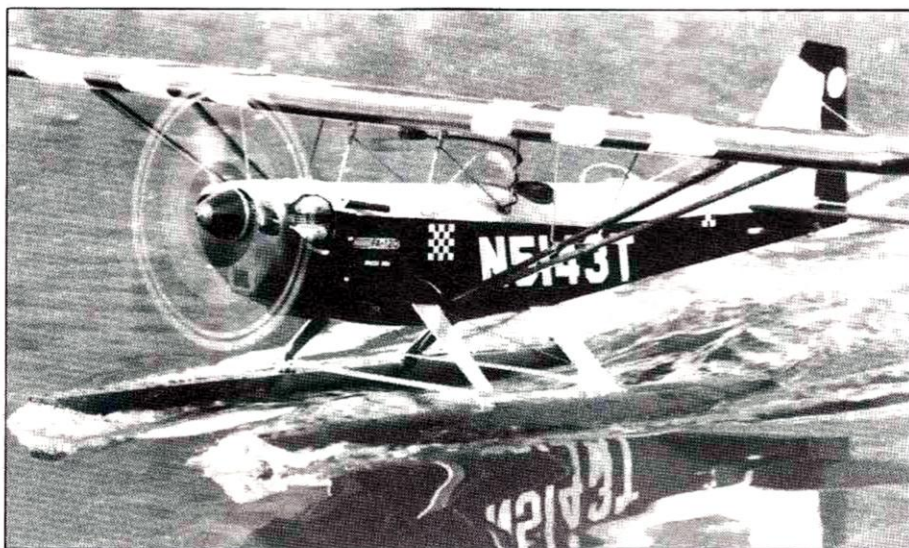


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Floating Around

by JOHN SULLIVAN



Abello's Citabria Pro taxis out. Internal fuselage gear deck makes for simple float conversion.

SOMEHOW, MY COLUMN has miraculously emerged as an amalgam of the flotsam and jetsam that I grandly call "my notes"!

To begin with, I must mention the advent of the first newsletter dealing exclusively with float flying. It's called the "Northwest Float Flyer,"* and it's published bimonthly by Ed Westwood and Charlie Gray of Spanaway, WA. I've just received the second issue and can tell you that Ed and Charlie are doing their homework. So far, they've discussed wing loading, landing-speed calculations, conversion specs on eight models, Northstar comments, attaching fittings, the Puyallup show, upcoming events, a mystery-ship contest and more. If you're like me, and just can't jam enough about float flying into your head, then this newsletter is for you. The annual subscription price is \$10, and I've included the address.

Another exciting news item is that Bob Martin*, Norm Goyer and the Lake Havasu Arizona Desert Hawks are planning a 1/4-scale Schneider Trophy Race for 1989! I only know what I've been reading in the magazines, and it sounds like these guys are not only going to pull it off, but are also on their way to establish-

ing regional events in other parts of the country. Exact rules for the contest are now being worked out, but preliminary specs have already been agreed upon as follows: Aircraft must be a minimum of 1/3 scale or 100-inch span. "Builder of the Model" rules *do not apply*. There are no engine restrictions other than that they must be piston-driven with fewer than 95



Jean Jacques Abello's Saito-powered Citabria Pro on fly-by.

dBs. The aircraft modeled must have been flown in a Schneider Cup Race. Pacific-Plan frequency flight stations will be in force at the contest.

Bob Martin will liase with the modeling community. You can contact him for information as to which Schneider Cup Seaplanes are being built, who's building them, and where. The organizers think

this event will attract entrants from Italy, England and France, in addition to the States, and—get this—first prize will be a check for \$1,000! Judges will award 50 percent of the points for scale fidelity and 50 percent for scale speed. I hope that, this time around, there will be no plans to retire the trophy. This is it, guys! The latest Byron Newsletter headline states that "Float and amphibian mania has struck!" and I'm happy to agree.

Three new float products have appeared on the market since this column last appeared: Carl Goldberg Models* has introduced a 36-inch built-up float for its popular Cub, which has a great scale-like appearance; Hobby Lobby* now handles a line of injection-molded and welded ABS floats with ply bulkheads installed; and Len Valie, up in British Columbia, has introduced a line of blue foam floats in no less than 20 different sizes.

Interest in *my* floats has been gratifying, and I thank all who responded. We have a dealer network in place, and you can now buy our floats from a growing list of suppliers. We've also added to our direct-order line of products, and we offer an item that I think you'll like if you can

stand listening to me babble about floats for an hour and a half. I'm referring to my video on float flying. It has segments on float design and selection, glassing and mounting, a detailed look at four types of floatplane, the Clearlake '88 meet, and dozens of flight shots from our club lake and other sites in Northern California. For those who'd like more information, my address is at the end of this article.

The lead photos this month are of Jean Abello's Citabria Aerobatic Pro. This kit by Balsa USA* is designed for .90 to 1.20 4-cycles and has an 80-inch span and a 51-inch fuselage. Jean powered his with the new Saito 1.20, added a duplicate gear blank for rear support, and hung a pair of Sullivan 40-inch floats on the Pro. The plane is covered with black and yellow MonoKote, and the whole package makes for a very striking aircraft.

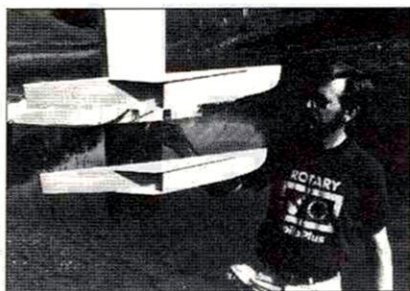
This is only Jean's third airplane, and his second plane on floats. Working alone, he picked away on his first plane for an agonizing five years, and then found someone to help him learn to fly it off land. Jean says that his first experience was sufficiently encouraging to make him want to continue, but so *frustrating* that he's purposely forgotten the name of the plane! His next project was the Goldberg Anniversary Cub, and he initially flew this off land, too. After four major crashes and rebuilds, Jean heard about our club in the Napa Valley and reasoned that nothing could be worse than the "fun" he was having. He strapped a pair of Gee-Bee's on his Cub, drove two hours from San Francisco one Sunday morning, and enlisted our help.

Owing to the tender bow on the Gee-Bee floats, the Cub had a real tendency to nose-over with the slightest application of power. Club member Mike Johnson took Jean under his wing, moved the floats forward and got the Cub to operate in displacement mode with full up-elevator until the plane was approaching step-planing, and then using slight back-pressure until it broke water. Jean kept coming back, and by the fourth weekend, he was making solo takeoffs and landings. He was all over the lake, but he went home with a whole airplane.

Mike is still working with Jean, and I'm sure the Citabria will be the first plane he becomes totally comfortable with. It's a reasonably big airplane that's easy to peg for orientation in the air. The Saito 120 just can't pull the Pro any faster than it wants to go. It has cabanes, struts, wires, a



Abello with his Balsa USA Citabria Pro. Plane has proven to be an excellent float project.



Fred Constantine displays modifications to his Robinhood floats.



Mike Hurst and Jim Thornton at the Hennessy Pontoon flying site. Two miles of runway, 400 yards wide.



World Engines Robinhood at rest. Saito 40 power.

fat airfoil and floats, and this combination of lift, drag and power results in a very stable plane that's capable of slow-motion aerobatics reminiscent of the way control-line planes fly.

Elsewhere, you'll find photos of Fred Constantine's Robinhood, which is powered with a Saito 40 four-stroke. This plane is one of only two planes that we've had problems with when adding floats. (The other was an Ace AirScout.) In both cases, the models repeatedly water-logged right at takeoff. Fred's a persistent type, to say the least. The first floats he used were scratch-built and had half a vee bottom on each float, with the bottoms canted towards an imaginary keel in the plane's longitudinal center. After several tries and dunkings, Fred abandoned that pair, despite the fact that none of us would believe that a setup like that wouldn't work.

The second pair of floats were vee-bottom, and they did the same thing! At this point, Fred added a sub-rudder equal to 20 percent of the vertical fin area. This allowed him to manage a takeoff, but he still went home deep in thought. A third pair of floats evolved—this time flat-bottomed, and yes, the plane was still difficult to manage at takeoff. Fred and I reasoned that we had only three remaining options: single or multiple keels, or either tunnel or cathedral-hull configurations. The fix you see here has worked admirably.

Fred's solution was adding two 1/16-inch plywood sideplates—like side dagger boards—to each side of each float. The first takeoff was so perfect, it was hard to believe that anything had ever been wrong. Since then, the only change Fred has made is that he's drilled 1/8-inch holes in the side plates just aft of the step to relieve the suction that develops in that area. This eliminated a neat pair of rooster tails that appeared when step-taxing, but it now allows the Robinhood to break water in less than 50 feet. I've learned one thing from all this: If at first you don't succeed, call Fred Constantine!

When you fly off the hard ground, nobody ever asks you what the runway was like last Sunday; the runway is always hard. One of this month's photos shows Mike Hurst and Jim Thornton with a Bob Martin Trainer and a Balsa USA Phaeton. The day was sunny and in the 80s. The wind was blowing steadily onshore, with two-inch ripples on the

(Continued on page 107)

1/8 AIR FORCE

(Continued from page 74)

his model. The ultimate scale R/C modelers have to be the ones who build magnificent planes and then go out and fly the wings off them in contests and

fly-ins.

Flying everything in sight was that great flier from Southern California, Jerry Kitchin. This year, he flew a Christen Eagle, a big Dago Red, a Byron Stagger-

wing, a Nosen P-51, a big Cub and a quarter midget racer—and these are only the ones I saw him fly! He had tough luck with his Eagle; during an inverted low pass, a glitch caused him to hit the runway and skid on the top wing and rudder for at least 100 feet. Amazingly, the damage wasn't too bad.

There are always many good fliers at the 1/8 Fly-In. One of the best is Billy Hempel from Tucson, AZ. Probably best-known for his flying of that huge, 105-pound, 1/4-scale F-82 Twin Mustang, Billy, in a big change of pace, put a 1/4-scale Cub through the hoops. There's nothing too unusual about that, except that he was low and slow. Doing slow rolls and point-rolls with a slow plane close to the ground takes great skill and nerves of steel. He put on a smooth, graceful show that was a joy to watch. Then he sped things up a bit by turning a big Fleet biplane every way but loose. The multiple loncevac at within 60 or 70 feet were particularly impressive. I later heard that Frank Noll had Billy flying his Extra 230—the highest compliment one great flier can give to another great flier.

A rarely seen model, the Knight

(Continued on page 104)

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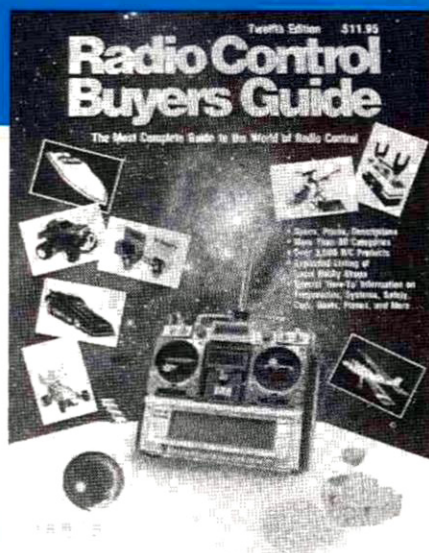
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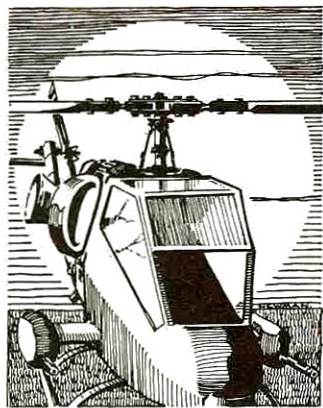
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Helicopter Challenge

by CRAIG HATH

WELCOME BACK! By addressing one area at a time, we've been working on setting up a finely trimmed model helicopter. In my most recent columns, the main issue has been the heartbeat of the helicopter—the collective pitch. I started by discussing the basic setup and then moved to fine-tuning this setup in an attempt to get as close as possible to a constant-speed rotor system. Now I'll explain the theory of constant rotor speed.

In a full-size helicopter, the pilot can govern the amount of lift by controlling the collective pitch separately from the throttle. This is accomplished by simultaneously adding and subtracting collective pitch and throttle at varying rates. In addition to this, the pilot also has gauges that indicate the speed of the rotor disc and the speed of the engine. To get the helicopter to ascend and descend, the pilot balances the controls so that the rotor and engine rpm remain in a limited range. In other words, the pilot actually



Author has played around with this new Omega Jet Stream from Kalt/Circus Hobbies; a very impressive machine.

keeps the rotor and engine at the same speed while making the helicopter climb, hover, land, etc.

Adding throttle alone will cause the rotor disc to speed up, because there's more power available to overcome drag. Adding more pitch to the rotor disc at the same time that power is added will create more lift, which uses the extra power from the engine without increasing rotor speed. Interestingly, this also tends to put an additional load on the engine, and the

rpm of the engine will remain fairly constant.

This effect allows the pilot to use a helicopter in the most practical and efficient manner. The engine may be kept at its best power curve or set to cruise in a more fuel-conserving range. These properties allow the rotor disc to fly the helicopter, while remaining at safe rotor speeds that don't overload the overall mechanics of the machine. The results improve the reliability of the mechanics and provide a consistent "feel" to all the controls. If the rotor speed was allowed to vary in great amounts, the controls would also vary in sensitivity as the rotor speed increased and decreased.

If you apply this theory to a model helicopter, you'll note that we don't yet have the ability to govern the collective and throttle separately, and that there are no gauges to tell us how fast the engine and rotor are turning. We're at a disadvantage, and we must rely solely on sound and the occasional use of a tachometer to tell us the state of our setup. In addition, there are obstacles that will limit our ability to get a true constant rotor speed setup on a model helicopter. As mentioned in last month's column, we'll have to make some compromises based on the type of equipment that's being used. There are some tricks that will help us to approach our desired results.

It may seem as though I've been harping a lot on the constant-speed rotor setup lately; I have! I think it's very important, because the resulting model performance is truly fantastic. Any helicopter trimmed in this fashion will respond effortlessly to almost any control input. It will climb out at full power without overloading and overheating the engine; it will come back to the ground in a predictable manner, and any maneuver can be performed more easily with this setup.

If you're learning to fly a model helicopter, you'll see what an advantage this can give you. This setup will make it easier to

perform some of the more difficult flight tasks well. For example, re-entry to hover from forward flight: This can be very tough if the machine isn't set up right. You could experience loss of control over the rate of descent and loss of tail-rotor control, so you'd have no idea where the helicopter will stop. With the constant rotor-speed setup, you can pick your landing spot and keep yourself out of trouble. Loops can be easily performed, because the rotor disc won't stall unless you pull very tightly. Rolls are also easier to do, as the engine and rotor don't overspeed as the pitch passes through 0 degrees heading toward negative when the ship is inverted.

One final note: The idea of constant rotor speed is being slightly modified by some fliers. They hover their helicopters at a slightly lower rotor speed, making the machines a little more docile in the hover, and then allow the rotors to unload a little more in forward flight for aerobatics. This seems to work very well, and it's really a matter of preference. Try both ideas: you'll like them!

As we begin to look at the specifics of the collective-pitch setup, one approach is to consider each problem as unique and

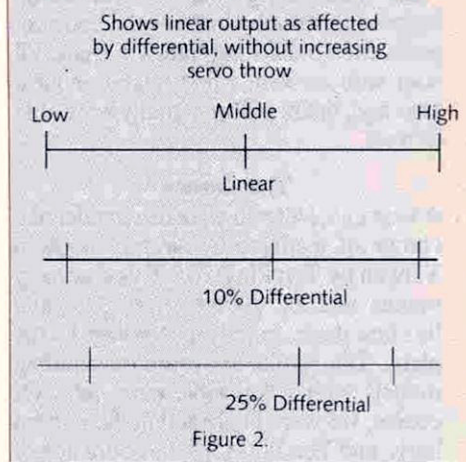
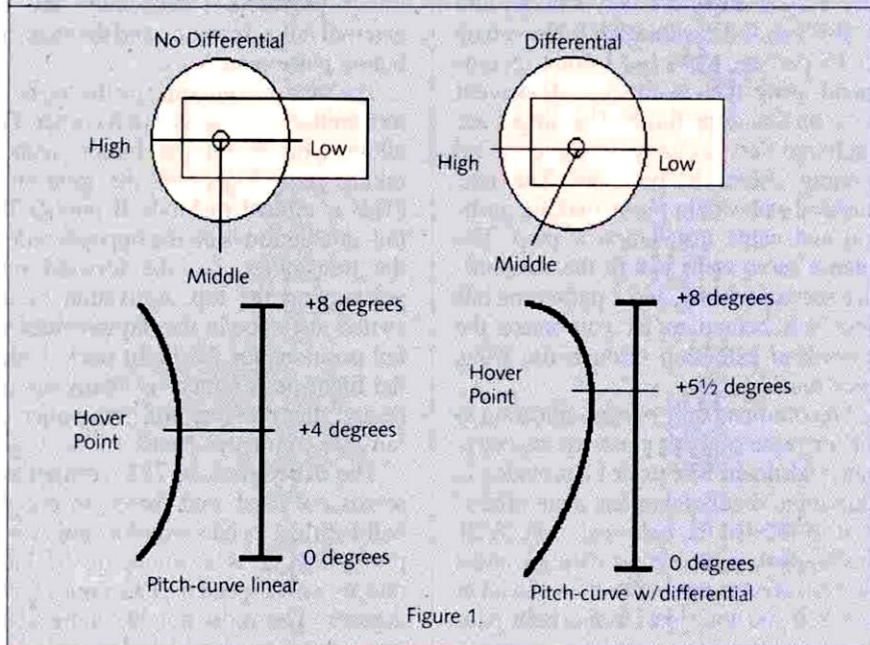
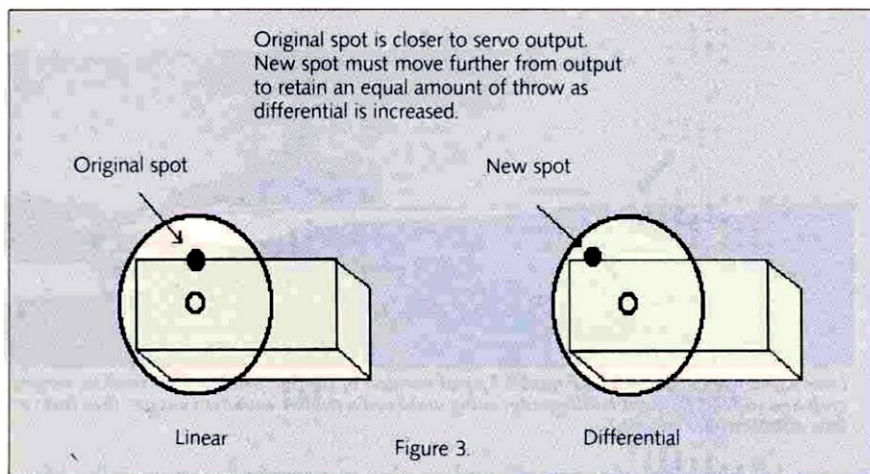


Jerry Lusk with one of his great flying GMP Cobras. He's been at this game for some years now, and has a fairly talented set of thumbs. The Cobra uses the Stork SE canopy, which is becoming a popular mod.

discuss it separately. The most common problem will be our subject for this month, since it really covers the basic obstacle to a good initial collective-pitch curve.



Dan Mehnik really knows how to set up a helicopter. Here's a close-up of his X-Cell .50 in action. Too bad this isn't color so you could see the candy paint job. Note the Wispertech muffler system that's hooked to a Webra Speed .50; a powerful, yet quiet, combination.



This is probably the most common pitch-curve problem and its solution depends on your radio system. If your radio doesn't have an adjustable electronic pitch curve, or separate end-point adjustments for the pitch channel, you'll have to cure the problem by using mechanical methods on the helicopter itself.

Let's look at the pitch curve in the example. The low point is 0 degrees and the high point is +8 degrees. If the entire collective system operated in an absolutely linear way, the hover point would be +4 degrees. Most collective systems aren't linear, so the hover point will usually be somewhere in the range of +3 to +5 degrees. As I mentioned in last month's column, setting up the pitch curve should really be started at the midpoint and worked out to the ends. With this in mind, let's say that for our example to fly at the proper rotor rpm in a hover, we'll need +5 1/2 degrees at the middle (the hover point). Let's also assume that we've already set the hover point to this setting, and the result gave us a pitch curve that looks like this: +2 degrees at the low point; +5 1/2 at the hover point; and

(Continued on page 115)



Frank Dykes, from Laurel, MS, shown here with his Kalt Baron 50. Frank can make this machine talk—no kidding! How about inverted hovering without using the invert system on his JR PCM 9 radio? Maybe sometime I'll tell you how he does it.

For instance, you might say, "The instructions tell me that my pitch curve should be set at 0 degrees to +8 degrees. When I do this, the helicopter hovers at Mach 3, and I think the thing is going to blow up. The rotor speed at hover is way too high, and the controls feel very sensitive. If I get the rotor speed back down to normal, the pitch curve changes to +2 degrees to +10 degrees, and hovering is the only thing the machine does well."

Pattern Matters

by MIKE LEE

THIS MONTH, I AGAIN bring you a couple of product tidbits. I like doing this kind of thing, because this hobby inspires the constant production of exciting things to share. I'll start with an item I first talked about a year ago, but now I've actually been able to try it.

The Aurora

A year ago, I let you all take a gander at a couple of ready-to-fly aircraft made in Taiwan by Ten Plus Co.* This company makes aircraft directly from kits and finishes them exactly according to the plans. The results are some outstanding models with impeccable paint jobs. Of course, we were interested in the pattern birds, and Ten Plus sells the entire line of MK and IM pattern birds, all painted and ready to go. My choice is the fabulous Aurora.

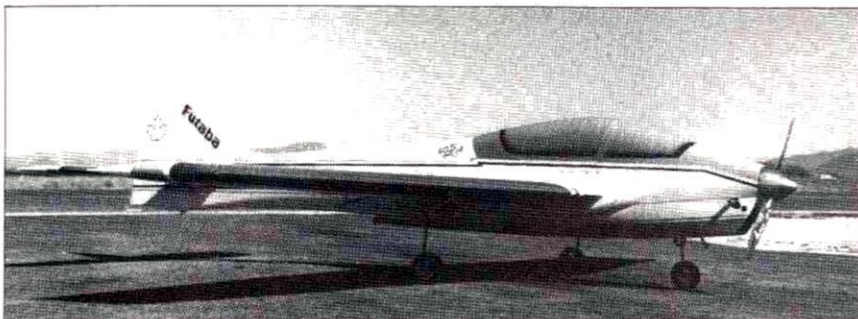
About a dozen of the Aurora ships are flown in my area; all have the same high-quality finish, the same weight and (amazingly) the same flying trim. These birds are *exactly* alike. By the way, the flying trim consists of about one-degree right rudder, and all other surfaces are at zero.



Kathy Lee poses with the Ten Plus Co., Aurora. Mini review reveals this bird to be of high quality, both in finish and flying ability. This shot is of the bird as it comes to you from Ten Plus.

My bird was just like the rest. Ten Plus strives to keep the weight down by drilling holes in the plywood doublers. The total airframe weight is about 3.25 pounds, and weight with all gear and engine equipment is 7.5 to 7.75 pounds.

The painted finish seems to be of silk



Ivan Kristensen's Summit EXP model. Latest version of the Summit features thicker, larger, stab and rudder, straight trailing-edge wing and Lord's rubber-mounted engine. (See text for info about rubber mount.)

and acrylic dope. It's very smooth and well-filled, and it withstands fuels with up to 15 percent nitro, but I don't recommend using fuels with over 10 percent nitro on any dope finish. The hinges are anchored very securely, so there are no pinning chores to be done. The rear pushrod exits are in place, making pushrod and cable installation a snap. The aileron servo wells will fit the standard-size servo perfectly, and a pull-string has been left behind to let you snake the servo-lead extension through the wing. Nice touch!

I recommend only one modification to the airframe, and this concerns the belly-pan hold-down. The stock kit provides an aluminum bracket that has a nut affixed to it to receive the belly-pan bolt. Well, this bracket isn't too great in the kit, and it isn't too great in this built version. In other words, if you don't like chasing belly pans that have blown off your plane, replace it.

Now the air test. With an O.S.* Max .61 RF Long-Stroke engine up front and the new jewel from Airtronics*—the Spectra PCM radio—for guidance, my Aurora came in at 7.5 pounds. The new Spectra radio is superb in every respect. With PCM encryption on an FM carrier, the Spectra has every feature a pattern pilot needs for competing: dual rates on aileron and elevator; auto dual rate for rudder; end-point adjustment everywhere; mixing; auto-throttle trim authority; snap-roll button and external fail-safe button. These are just a few of the good

things provided. I especially like the external fail-safe button and the snap-roll button placement.

The snap-roll button is on the top of the transmitter—the forward left corner. This allows you to hit the button without taking your fingers off the right stick. (This is critical to Mode II pilots!) The fail-safe button is on the opposite side of the transmitter, i.e., the forward right position on the top. Activation of this switch just once in the day provides the fail positions for the flight pack. Unless the flight-pack battery is totally disconnected, the receiver will remember the fail-safe command. Neat!

The Airtronics 95732 competition servos are used, and these are double-ball-bearing, coreless-motor and waterproof. Torque is a whopping 67 inch/ounces with a speed of .19 seconds for 60 degrees. The most notable thing about this servo is the dead-band timing of 1.3 milliseconds, which is extremely tight.

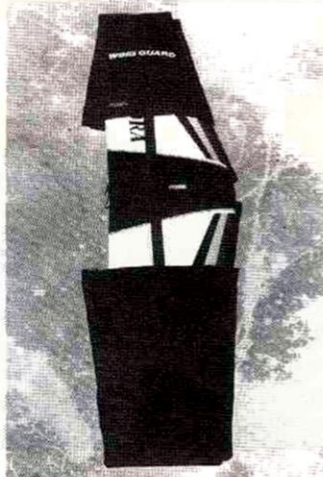
In the air, the Aurora is a sheer delight. It's very fast, yet amazingly smooth in pitch. The roll rate is pretty rapid and displays no bad falling while rolling through inverted. Knife-edge flight is sweet, with no noticeable pitch deviation, while vertical flight requires just a hint of down elevator as the ship leans slightly toward the canopy while going straight up. Coming down is no problem. Yaw control is very positive, making stall turns easy and knife-edge an everyday affair. The big question is: Is the Aurora worth

its price?

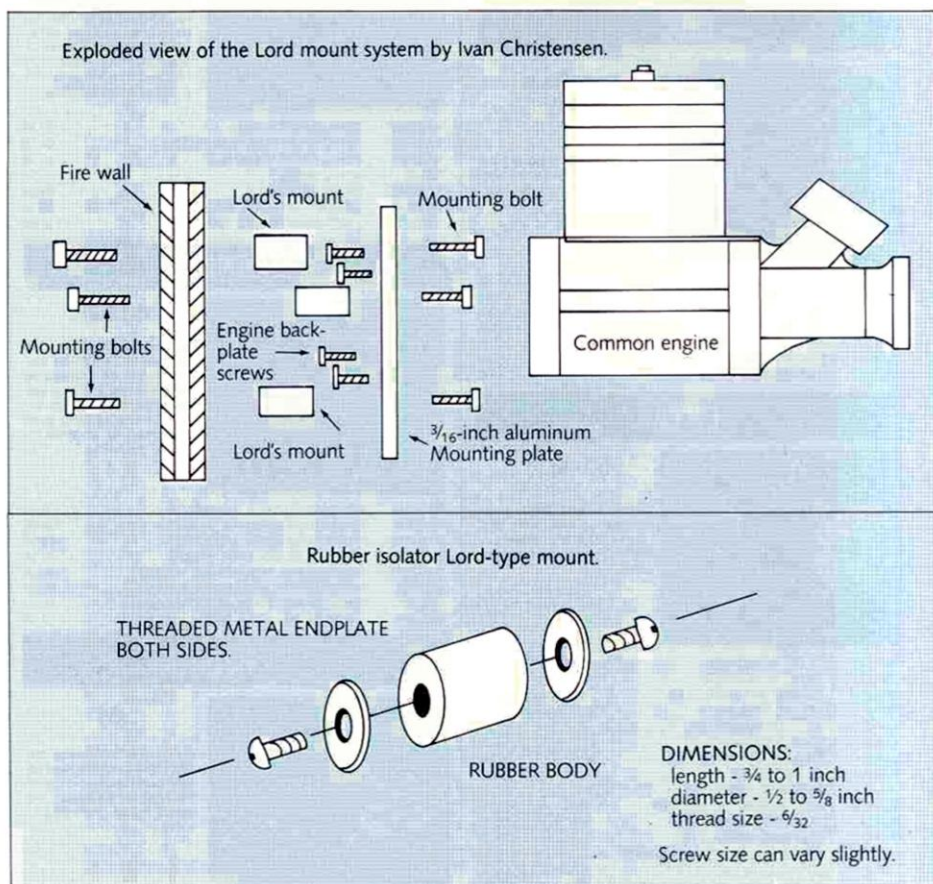
The current price of \$775 (as of March 1988) is a decent price for this top-notch aircraft. I can't build and finish an aircraft of this caliber. There are those who can, but they'd charge twice as much for it. The aircraft is straight and true (and this is at least *half* the battle of flying a good pattern) and it performs as expected. The bottom line is whether you can *build* a ship of this high quality for about the same price, remembering that time is also a major consideration. It would take me about four months to reproduce this ship. With this in mind, I *bought* it. With the Max .61 RF and the Airtronics Spectra radio, we have one deadly combination for pattern.

This is an outstanding ship with a superb radio and a proven engine. Even though the Aurora is light, many other engines will perform well in it. But I insist on dependability, so I chose the O.S. Max.

A final note: Our photos show an interesting wing cover on the Aurora, and it's suitable for protecting the finish on any aircraft. These are Wing Guard padded covers from Slimline Mfg.*, which is chiefly known for its mufflers. The Wing Guards are nylon fabric shells



Wing Guard wing covers by Slimline Mfg. These nylon, fabric-covered, foam sleeves are available in a variety of sizes, including the tapered ones shown here. (Contact Slimline.)



with rubber foam inside to provide excellent wing protection for our valuable birds. They are available in many sizes, including the tapered ones we show here, and they cost about \$25 a set. Contact your local hobby dealer or Slimline for more information.

Engine Mounting

Our tech talk deals with a new way to reduce sound emission and insulate the airframe from vibration. Some time ago, I showed you all a unique engine-mounting system by Merle Hyde. This system utilized rubber inner tubes, plywood discs and a couple of those clamps to make a soft engine mount. Here's another soft engine mount that's really easy to make.

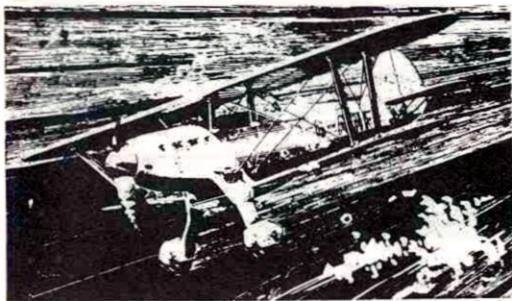
This idea came from Ivan Christensen of Canada, who uses this method in his latest Summit EXP design. Referring to the drawings, Ivan uses small "Lord's"

rubber mounts to make his soft engine mount. The system is very simple:

First, make the backplate mount for the engine. This is made from 3/16-inch-thick 6061 T-6 aluminum. You can choose a suitable shape; we show what Ivan is using. Ivan has drilled large holes in it to save weight. A hole is drilled at each corner to allow the rubber mount to be bolted on. Each mount is about 3/4 to 1 inch long and about 1/2 to 5/8 of an inch in diameter (very small indeed). I think that slightly larger ones could be used, but the main thing is to find some with holes matching a 6/32-size screw. Once found and mounted, you'll notice that the plate is also drilled to accept the engine via the backplate screws; just get slightly longer screws for this.

At the fire wall, the mounting bolts poke through and into the rubber mounts.

(Continued on page 114)



Golden Age of

by HAL "PAPPY" DeBOLT

THIS MONTH, I'LL START with a topic that's not related to OT R/C but is something that could affect R/C tremendously. News of such items is often seen in unexpected places, and this information comes from the February 7, '88 issue of the Sunday "Parade" magazine.

Japan's Sony Energytec Corp. has announced a major breakthrough in storage batteries that seem to be just what we've been waiting for. These new manganese-oxide rechargeable cells are only a quarter of the weight of a Ni-Cd but have 2.4 times the capacity. Digest that for a moment, and then imagine what these new cells can do for R/C and electric power. I just had to pass along news of this *major* step forward.

I continue to receive interesting, valuable input about OT activities. For example, do you recall my recent mention of a Leapin' Lena as a possible modern kit for an OT R/C design? A reader sent me information initially given to him in 1953 by Modeltech Specialties, the original manufacturer. This info indicated that Charles Underhill was the probable designer. I passed this information on to you with the hope that you might find a modern kit that's to your liking.

Now I have a fine response from Fred Lehmborg. Besides providing additional Leapin' Lena info, Fred reminds us of the *many* small manufacturers that the explosion of R/C in the early 50s gave birth to. There was a great demand for R/C kits and a scarce supply. When this became apparent, numerous modelers formed embryonic manufacturing operations to produce their own designs. As R/C marched on, many of these initially successful companies fell by the wayside. A brief history of Modeltech Specialties illustrates this.

Fred Lehmborg tells us that *he*, and not Charles Underhill, designed the Leapin' Lena. Apparently, Fred had some success with free-flight designs prior to his R/C designs. One of his most successful was a cute little cabin-style plane, which he

labeled the "Feather Merchant." Getting involved in R/C in rudder-only days, he quickly saw the need to consider aerodynamics in his search for the aerobatic ability that single control couldn't provide. His search for a possible solution led him through several designs that culminated with the Leapin' Lena. By using a short coupling and an appropriate force arrangement, he managed to make an aerobatic model that could perform wildly under the guidance of an accomplished pilot. The industry atmosphere was one of optimism and expansion, so Fred and several friends thought there would be a market for the Leapin' Lena.



Flight-line action in Cincinnati, OH—1961. Flying was a family affair; safety precautions rule this out today. Planes appear to be a Midwest Esquire and an L. W. Pursuit.

As a result, Fred Lehmborg, Edward Steffenhagen and Charles Underhill started production as Modeltech Specialties. Kits were sold by direct mail and through Polk's in New York City. As their business expanded, a scale Fokker DVIII and a Firebird (for pylon racing) were added to the line. As far as we can tell, all were viable kits, and they should have had a good future.

As many of these early entrepreneurs discovered, success in business comes through high-volume sales, and this can only come with widespread distribution. Apparently, those at Modeltech Specialties saw some of this, and other pastures started to look greener. Steffenhagen moved to New York City, Lehmborg went to California and, since Underhill didn't want to continue alone, Modeltech Specialties was dissolved.

Of more importance to us now is that Enterprises Lehmborg* apparently offers several OT kits, and these might include the Leapin' Lena. If you're interested, drop them a line.

It was great to tell you about 75-year-old Lewis Chambers and to show you some of the extensive fleet of original OT R/C models which he flies continually. He called one the UFO, because he'd forgotten its origin, and I asked for your help in identifying it. A letter from Tom Ailes of Valpariso, IN, brought the needed info. Tom is an accomplished OTer with a vast store of OT models, kits and equipment, and he's willing to share his knowledge with us all. Tom did some research and determined that the UFO was actually from a Guillow Vanguard kit produced in about 1960. The Vanguard was a .049-powered rudder-only in the trainer tradition. Lou Andrews, who designed many Guillow kits of that period, was the designer.



Cliff Bennett's scale Waco at a 50's ARCS contest, Monroe, MI. Swept-fin beam in photo was by Chuck Mesler.

Many of us know Lou best for his Andrews Model Aircraft Co. and the many fine R/C kits this company offered over an extended period. Heading a long list of "Ray" designs is the famous Aeromaster biplane, which seemed to have an endless life span; it was used for almost all facets of R/C by all kinds of modelers.

If someone has specific details of the Aeromaster, (photos, three-views, etc.) of this fine design, they'd be good for discussion. Can *you* help?

Lou Andrews began his commercial modeling career as a designer for Paul K.



Andy Lennon with his OT boat, 30 years later. Now with more power and modern proportional radio. (Details in text.)



Andy Lennon's rebuilt 1957 flying boat. Originally flew with single channel and compound escapements, R, E and M.

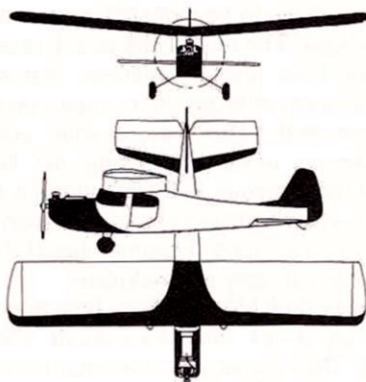
Guillow Inc. of Wakefield, MA. Guillow was a leading supplier of those "stick-and-tissue" scale rubber-powered models, which young modelers used to cut their teeth on. I think Lou once said that his initial efforts were in designing some of those models. How much engineering did it take to get the multitude of intricate parts, stringers, etc., to fit exactly? Haven't most of us awakened in the middle of the night after a nightmare about just one part that was overlooked or didn't fit?

Once in the saddle, Lou's expertise led Guillow into some attractive control-line models. The Trixter was one of their outstanding kits, and it was probably the first kit in which upright and inverted C/L flight were equalized. Early on, I gained much experience in inverted flight with a friend's Trixter. As you may recall, the Trixter brand name continued with the Guillow R/C Beam, etc. Other Guillow-Andrews kits aren't as well-known; the Vanguard was one.

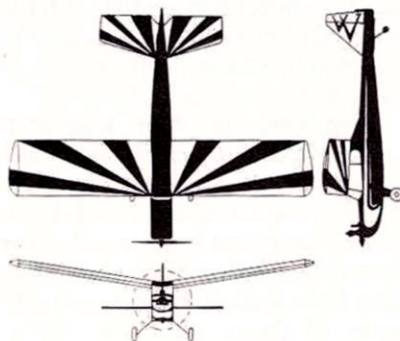
A timely letter from Tom Ailes gives us the chance to see another Andrews-

designed Guillow kit. As can be seen in the three-views, the Smog Hog definitely influenced the Guillow Explorer. This isn't surprising, as the Hog was in its prime in 1958 when Lou designed the Explorer. The Hog influenced more than just the appearance of the Explorer. Like the Smog Hog, the Explorer has a semi-symmetrical airfoil, wing location and general arrangement. It was also .35-powered, but was considerably smaller, with a 58-inch span. In retrospect, the Explorer was a much snappier performer than the docile Hog.

Why didn't these kits find a more widespread acceptance? A word from



Paul K. Guillow Inc., 1958 Explorer kit; a Lou Andrews design showing "Smog Hog" influence. Fifty-eight-inch span; .35 power.



Chamber's "UFO" is a Guillow Vanguard! (Another Lou Andrews design for 1/2A power in 1960.)



From England, Gordon Rae sends a 1951 action shot of a Keil-Kraft Junior 60 flying at Pershore Airfield. Single-channel, Frog 5cc glow-powered and an E.D. radio.

Tom may explain. He says that when he contacted Guillow in 1963, he was told that the tools, dies, etc., for these two kits were destroyed in a fire and couldn't be replaced. Tom had three Vanguards over the years; he flown the first two with CG single-channel equipment. The third was finished, but never flew, and it still hangs in his garage! He bought an Explorer kit about 10 years ago for \$7.50, is now building it, and he may be flying it as you read this.

The club Tom belongs to has always been large, but there are now only four OTers left. When younger members watch the OTers fly single channel, they always wonder how such models can gain and lose altitude, and how fliers are able to land them just where they want them. Tom fears that with the passing of time, much knowledge of early R/C adventures will be lost forever. He wishes someone would record these experiences, so I hope Tom appreciates my attempts to do just that in this "Golden Age of R/C" series. Additionally, Tom thinks that there's a definite need for an OT R/C organization, not only to record and encourage OT R/C flying, but also to broaden the interests of *all* R/Cers. Tom wants to be the first member! In my April '88 column, I advocated such an organization, and many of us have high hopes that an OT R/C organization will become a reality.

This seems to be a month of catching up with OT R/Cers' activities. Andy Lennon has reported in from Quebec, Canada. Those who are familiar with the Eastern Provinces will know that they have an abundance of beautiful lakes that encourage R/C water flying. The bug bit

(Continued on page 107)

Quiet Flight

by JOHN LUPPERGER

AS I WRITE, the summer contest season is in full swing, and it's becoming evident that never before in R/C modeling have we had so many high-tech goodies to make our hobby enjoyable. Not only do these high-tech products make our hobby safer, but they also raise the level of competition.

Improvements in building materials have resulted in stronger, lighter models, and the newest radios are more capable and more dependable. Electric motors are stronger and more efficient, and batteries deliver more power along with greater capacity. Using new findings in aerodynamics, we soar to greater heights with more efficient models.

Yes, it's still true that a great pilot can win with a model as simple as an Oly II or a Paragon. But now it's more likely that the model in the winners' circle will be a multi-channel ship with dual rates and computer-generated airfoil.

However, although we live in a time of great technological advancements, we can still have fun with the *basic* materials and the models that they produce. This column has been rather general, as I was waiting to see what kind of response I'd get from readers. Your letters have dealt with many subjects, but the majority have been about the basics, e.g., building.

I've just bought a Wanderer, and over the next few months I'll show you how to modify the model to improve its performance. If you're just starting and would like to follow along, buy a Wanderer and we'll build a top-notch trainer together.

Toledo

Last month, I told you about some of the new goodies shown at Toledo. This month, I'll finish describing new products that are of interest to those of us who enjoy quiet flying.

• **Sonic Tronics***. This company is developing a complete line of electric folding props based on the original prop designs of Tom Kerr. Tom has been making fiberglass folders with aluminum hubs that have proven to be extremely good

propellers. These new props are of glass-filled nylon, with hubs made of the same material. They have been pull-tested and are strong enough to be used with cobalt motors, and they'll range in size from 6x4 to 13x7. This will cover a wide variety of direct-drive and gear-driven motors, and it's a product we've all been waiting for!

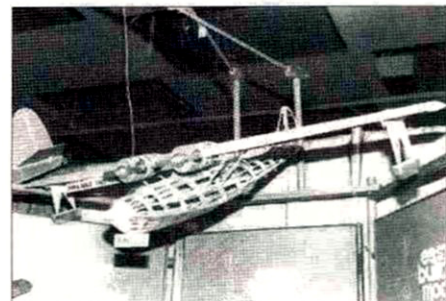
• **Hobby Lobby International***. Having always had a great selection of sailplanes and electrics for the "quiet" enthusiast, Hobby Lobby now supplies the latest in large cobalt motors from Graupner. The Ultra 1200 will handle 10 to 20 cells and the larger size will handle 15 to 30 cells. These motors will handle large (3 meters and over) sailplanes and larger scale models. They are a little longer than usual, because their brushes and brush holders are inside their cases, but this allows them to be mounted in narrower fuselages. The rear of the motor case is made from phenolic material that will break away with any direct impact on the motor shaft. This way, if your model makes an unwanted landing, the shaft and the armature will push through the rear, so saving the most important part of the electric motor. I assume that Hobby Lobby will carry the backplates.

• **Easy Built Models***. Easy Built models are an electric modeler's dream come true. The company has an extensive line of free-flight models and suitable ones are being converted into electrics. At the booth, I saw a Stinson for 035 direct, a Beaver for direct or geared 05, a PBY for twin direct-drive 020s and a soon-to-be-converted (from free flight) Spitfire, that will probably be for gear-drive 05s.

There were also three designed by Laddie Mikulasko, specifically for electric motors. Laddie has had several designs published and kitted, and is well-known for producing good flying models. There was a Pilatus Porter PC-9, a Pober Pixie and a Bebe Jodel D-9. All three models are for 05 electric, but I didn't see any information that indicated whether they would be direct drive or gear drive. These good-looking models will make a big

impact on the electric scene.

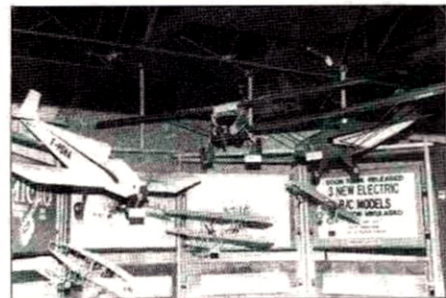
• **Parma International, Inc.***. That's right—Parma now makes an electric airplane. The new Aero Tiger has been designed to give R/C car enthusiasts an easy entry into the joys of electric flying.



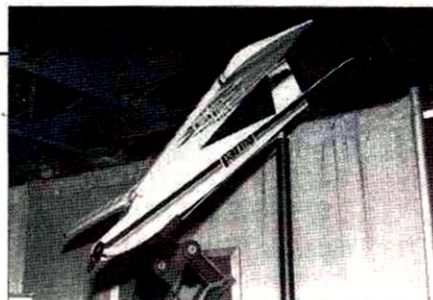
PBY from Easy Built is designed around twin Cobalt 020s and was the hit of E-B's booth. It should be available this fall.



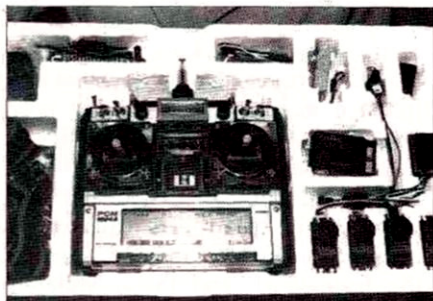
Sonic Tronics' new folding props: First to be released are the 6x4, 7x4, and 8x4 shown here. These will give direct-drive models a big performance boost.



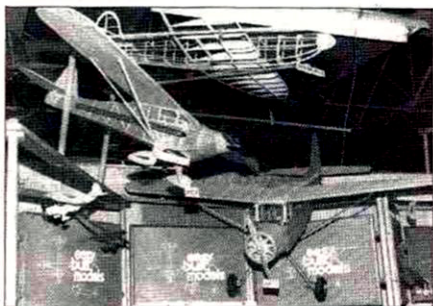
Three 05 models designed by Laddie Mikulasko and kitted by Easy Built Models. Left to right: Bebe Jodel D-9, Pilatus Porter PC-9 and Pober Pixie. All three models should be available by the time you read this.



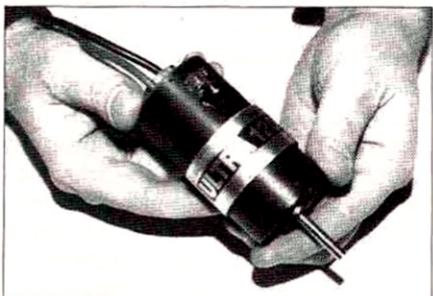
Parma's Aero Tiger was designed to interest car enthusiasts in flying. Simple design would be easily built by the first-time aero modeler.



Futaba's new PCM 1024A has all the bells and whistles you could ever want or need. Radio is computer-programmable to do almost anything, and gives LCD read-out of programming.



Easy Built's Stinson is for Cobalt 035, and its Beaver is for 05 direct or gear drive. Stinson shows off its free-flight heritage with stringer-type construction.



Hobby Lobby's new Graupner Ultra 1200 Cobalt Motor is capable of handling 10 to 20 cells and is perfect for larger sailplanes and scale models.

It's a high-wing, cabin-sport model with a flat-bottom airfoil, and it uses three channels on rudder/elevator/throttle on/off. With a car motor, a 6-cell battery pack and a speed controller, the R/C car enthusiast has only to add a prop to have a good flying trainer. The all-wood kit is of simple construction and should present the newcomer with very few problems. (Editor's note: The R/C car convert should, of course, be aware that his car-frequency radio is *not suitable* for use in any airplane and will require a frequency change to the "aircraft-only" channels.)

• Futaba*. The new PCM 1024A 9-channel radio from Futaba is designed primarily for pattern fliers. The radio Futaba displayed in its booth is one of only a handful in the country, and there wasn't much information available on its capabilities with regard to gliders. This is one of the new generation of computer-controlled radios, and it can be programmed in several ways for various models. Dual rates and mixers are set up by percentages on the LCD read-out panel. There are several mixing possibilities that should allow it to be set up for F3B-style sailplanes. When more information becomes available, I'll pass it on.

There were more new products than I've been able to tell you about. You'll probably soon see ads featuring many of the products shown at Toledo, and if manufacturers send me info on their new products, I'll share it with you.

LeMans AP-29 Motor

From the newsletter of the Puget Sound Electric Model Flyers, Seattle, WA, comes this interesting review of the Kyosho* LeMans AP-29 motor by Bernard Cawley, Jr.:

"Ever since Astro Flight dropped the Ferrite 020 and 035, I have been lamenting their loss because, even though there are now Cobalt 020s and 035s, and even though they are powerful and fit standard accessories, these motors are heavier, bulkier and much more expensive than the little ferrites they replaced.

"Recently, Kyosho introduced a couple of small electric ARFs, which are smaller than 05 size. The little low-wing one, the Robin, is powered by a special small motor known as the AP-29, and this motor is now available separately for a current list price of \$29.95.

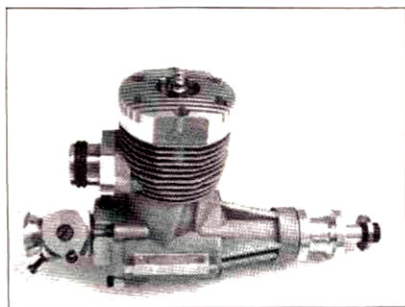
"The AP-29 is just a little larger than the old ferrite 035; slightly less than 2 inches long and 1 1/8 inches in diameter (or 29mm, which must have something to do with its name!). It weighs about 3 3/4 ounces with power leads and a Leisure prop adapter. It has a 1/8-inch-diameter shaft, just like ferrite 05s and 020/035 Cobalts. However, the spacing between the mounting holes in the front of the can is only 3/4 of an inch (19mm) and not the standard 1 inch, unlike the spacing on the front of the ferrite 020/035. Therefore, no currently available speed reducers will fit it without some kind of rework. Also, since the rear end bell is held on by crimped tabs and the timing is advanced to favor direct-drive (counterclockwise) rotation, the motor wouldn't perform its best when run in the other direction.

"The rear end bell has an open construction with big, square, replaceable brushes. They have shunting pigtailed and clock-spring-type brush springs, just like those on the best of the ferrite 05s (LeMans, Leisure, Yokomo car motors, etc.). The commutator also has a relatively large diameter. These features, plus a very close spacing between the magnets and the armature, make for good, efficient performance.

"The supplied prop adapter is a hexagonal brass affair, threaded for a tiny screw that's not supplied. The prop adapter is shaped to fit into a cavity behind the props used on the small Kyosho ARFs. These props are fairly ordinary 6x4s, but they're quite expensive (about \$2.50 each, in packs of two). Fortunately, the prop driver is held on with a setscrew so it's easily removed, and thanks to the 1/8-inch shaft, any 05 prop adapter from Astro, Leisure, Goldberg, Davey, etc., will fit. I

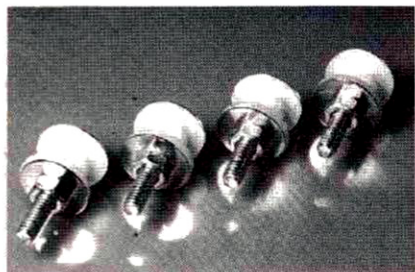
(Continued on page 110)

Product News



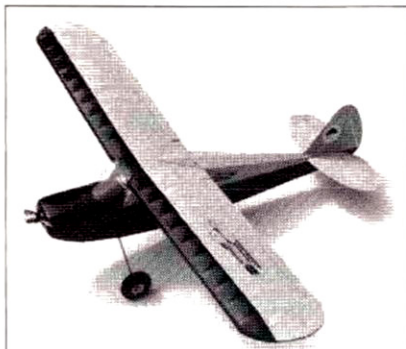
BOB VIOLETT KBV .80 FAN ENGINE

The KBV .80 ducted-fan engine incorporates all the technology and materials that made the .72 version so reliable and long-lasting. A new crankcase casting, an enlarged bore and stroke and a few minor improvements to the carburetor and exhaust header add up to more horsepower. The .72s have been officially clocked at 173mph in the Aggressors and Vipers, so speeds of 180mph are anticipated with the new .80 when it's combined with the Violett fan unit. The KBV .80 can also be used with the Dynamax Fan for improved performance. For this application, a different front-end spool and retaining nut will be supplied upon request. For more information, contact Bob Violett Models, 1373 Citrus Rd., Winter Spring, FL 32708.



A.H.S. SILICONE ISOLATORS

These silicone isolators absorb most of the unwanted engine vibration associated with 2-cycle big bangers. The set includes: eight silicone shoulder washers, eight fender washers and four hex-head 1/4-inch by 20 bolts with matching hex-nuts. These silicone washers are designed for a 1/2-inch fire wall and for use with an engine no larger than a Quadra 50. For more information, contact A.H.S. Manufacturing, 13 North Main St., Centerville, OH 45459.



AERODROME MODELS BABY PACER

The Baby Pacer has a 50-inch wingspan, weighs only 2.5 to 3 pounds, has a wing loading of 19 to 25 ounces, and flies with a .15 to .40 4-stroke or .19 to .25 2-stroke. It's also possible to power the Baby Pacer with an electric motor. The kit features hand-cut parts of select balsa and basswood and preformed landing gear and tail-wheel wire. This is the first in a series of small aircraft like the War Bird Series. For more information, contact Aerodrome Models Ltd., 2623 South Miller Rd., Saginaw, MI 48603.



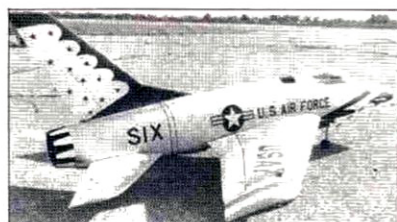
HOBBY DYNAMICS JR RADIO

JR Propo's new Max Computerized 6-channel radio system provides state-of-the-art style and quality at guaranteed low prices. These radios are available for helicopter and pattern-flying enthusiasts. Some features common to both the heli and pattern Max radio are: selectable transmitter modulation programming (PCM or PPM); programmable exponential throw for aileron, elevator and rudder; and end-point adjustments on all channels. For more information, contact Hobby Dynamics, 3132 S. Highland Dr., Las Vegas, NV 89109.



WALT MOUCHA CHARGER MKII

The Charger MKII is a fully aerobatic biplane designed for a full range of engines, including .60 to .90 2-stroke or .90 to 1.2 4-stroke. The Charger, with a wingspan of 60 inches, a 51-inch fuselage length, a 1,080-square-inch wing area, and a .90 4-stroke engine weighs in at 7 3/4 pounds. The kit includes die-cut ribs, formers, lite-ply doublers and fuselage sides, pre-bent landing gear and cabane wires, Mylar decals, and all the necessary hardware, apart from hinges and pushrods. There are two sheets of full-size rolled plans and a complete instruction manual showing the framework and the completed model. For more information, contact Walt Moucha Models, P.O. Box 112, Menominee, MI 49858.



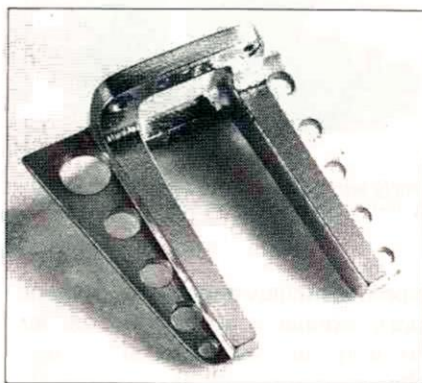
CENTURY JET F-100 SUPER SABRE

Century Jet Models is proud to announce the release of its semi-kit, stand-off 1/8-scale F-100 Super Sabre. The kit includes a 63-inch fiberglass fuselage that's designed to accommodate most popular .77 to .81 fan systems. Also included are foam wings, stabs, rudder, canopy, radio compartment, stabilizer control hardware, full-size plans, instructions and Thunderbird paint templates. With its 50-inch wingspan and its 760-square-inch wing area, this sleek fighter has a takeoff weight of 11.5 pounds. No wood is included; a drag chute and other accessories are available. For more information, contact Century Jet Models, Inc., P.O. Box 111, Rantoul, IL 61866.



ELDON PORTABLE SOLDERING IRON

The Ungar 1200 Rechargeable is a portable soldering gun suitable for all types of quick soldering jobs and for use in areas where power isn't readily available. The tip heats up rapidly to provide as many as 250 solder joints between charges. Optional accessories include a fine tip for electronics applications and a 66-watt heavy-duty tip for heavy electrical work or metal repairs. The unit also features a UL-listed charging unit, a safety lock, and a trigger-activated light. A bail on the handle enables the user to hang the tool on a wall or pegboard for convenient recharging. For more information, contact Eldon Industries, Inc., 100 West Manville St., Compton, CA 90220.



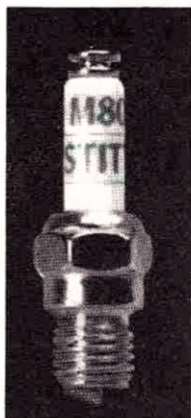
J'TEC RACING MOUNT

This Formula 1 Racing Mount from J'Tec is precision-ground, cast aluminum for .40-size racing engines. The engine-mounting beams have built-in webs that enable them to be fiber-glassed directly to the fuselage. By making the engine mount an integral part of the fuselage, vibration on rear intake engines is reduced, and this results in increased rpm. For more information, contact J'Tec, 164 School St., Daly City, CA 94014.



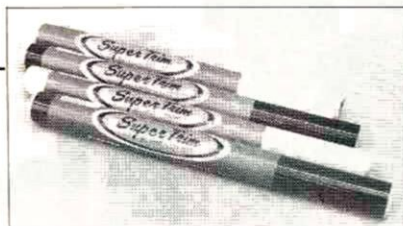
FUTABA HIROBO PROFESSOR

Futaba introduces the new Hirobo Professor, an Almost-Ready-to-Fly (ARF) R/C trainer that's designed to make electric flying easier than ever. Its extremely stable design and quiet operation make the Professor an ideal first plane for beginners. The Professor features special, lightweight materials for exceptional strength and rigidity, and the built-up pre-covered wing, stab and tail make assembly simple. Just join the wing halves (epoxy provided), and attach the stabilizer, the tail and the pre-installed linkages. Install the radio and the batteries, and you're ready for takeoff. For more information, contact Futaba Corporation of America, 555 West Victoria St., Compton, CA 90220.



STITT MICRO-SPARK PLUG

This 1/4-inch by 32-thread, micro spark plug—designated the M-80—is the first in the industry to employ high-temperature sealing techniques that ensure 100-percent gas tightness in both 2-stroke and 4-stroke model engines using either methanol- or gasoline-based fuels. The technology Stitt uses to manufacture the world's largest stationary, continuous-duty industrial engines now allows the world's smallest spark plug to be manufactured to Stitt's high-performance, long-life service standards. For more information, contact Stitt Spark Plug Company, P.O. Box 327, Conroe, TX 77305.



SIG SUPERTRIM

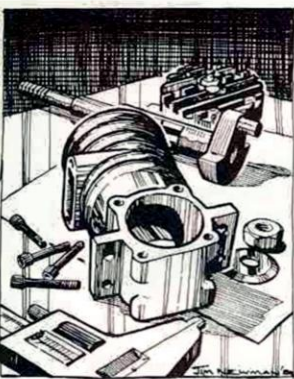
To put the finishing touch on your color scheme, use Sig's new SuperTrim Self-Adhesive Trim Rolls. Use them to make easy-to-apply decorations that will give your new airplane that professional look. It's the easiest and fastest way to add stripes, sunbursts, checkboards, lettering and insignias to your model. SuperTrim is extra-thin and light, but it's totally fuelproof; the extra-strong adhesive resists fuel and oil seepage.



SIG CA GLUES

Sig Manufacturing has just introduced a complete line of CA glues for virtually every modeling application. The Sig CA Slow is a high-viscosity adhesive that allows maximum working time, and it's ideal for filling small gaps where the less viscous CAs are inappropriate. Sig's CA Plus is a medium-viscosity, general-purpose adhesive for most modeling applications. Sig's CA Thin is a fast-drying adhesive with excellent penetration for tacking pieces together or for applications (e.g., wing construction) where a fast cure time is a must. Also available is a CA accelerator and de-bonder. The Sig Kwik-Shot Accelerator will force-cure all CAs, promote fillet-forming, expand gap-filling capability and speed construction. The Sig De-bonder will remove cured CA from virtually any surface. For more information, contact Sig Manufacturing, Inc., 401 South Front St., Montezuma, IA 50171.

Descriptions of new products appearing in these pages were derived from press releases by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by *Model Airplane News*, or guarantee product performance. When writing to the manufacturer about any product described here, be sure to mention that you read about it in *Model Airplane News*.



About Those Engines

by JOE WAGNER

OF AMERICA'S THREE major model engine manufacturers—Cox, Fox*, and K&B—Fox has been longest in business under the same management. K&B started in 1946, and Cox entered the model engine game in 1948 (although its motors were actually made by Cameron Brothers until 1950). However, both companies have changed ownership more than once since they were formed. On the other hand, Duke Fox has owned his company since its origin in 1949; next year he'll celebrate its 40th anniversary.

The first Fox-built engines (.35 and a .29) were designed exclusively for U-control use. With their rough, sand-cast exteriors, they may not have looked pretty, but they were marvelous runners and soon became the standard by which all other control-line stunt engines were judged. Even today, it's difficult to find a .35-size engine that can outdo a Fox 35 (still being made!) in a U-control airplane.

Duke Fox has always been an innovator. His first engine design to be put into production—the Fox .59, manufactured by the Claude C. Slate Co. in 1947—bore little resemblance to previous model motors. The Fox's exceptionally long case front and crankshaft could be installed in much sleeker, more streamlined airplane cowlings than was possible with any other engine of that time. The Fox .59 was a spark-ignition engine, and another unusual feature was that its timer points and needle valve were both at the rear of the motor. They were somewhat awkward to manipulate in that location, but I've never heard of anyone's fingers slipping into the prop disc while adjusting a running Fox .59.

The .35 and .29 looked much more conventional than the .59, but they included a subtle feature that no other engine of the era had: Their cylinders were slightly offset from their shaft center lines. Many of the later Fox motors have also used this feature. It's called a "DeSaxe" cylinder, and its purpose is to

provide a more direct connecting-rod action on the power stroke. This offset adds a little extra torque and somewhat reduces the side loads on the cylinder wall, both of which tend to wear its bore into an oval shape with protracted use.

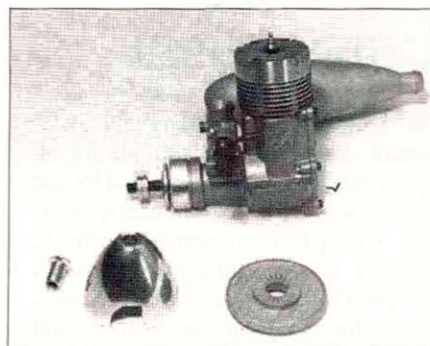
Over the last 39 years, Duke Fox has manufactured engines in every size from .049s up to motors for target drones and power-assist on bicycles. Not all have been successful; the worst is the infamous zigzag crankcase Fox .19 of 1953. (Duke disposed of most of these by literally burying them! Today, they're valued collectors' items!) However, over time, Fox engines have maintained an excellent reputation for quality.

Fox's first R/C motors were the twin-needle-valve series of 1954: the .19, .29, .35, and .59 (which was a re-designed version of the original 1947 Slate-built .59). For these versions, R/C airplane engine speed control was accomplished by an escapement-operated clapper valve. This turned the fuel flow of the second needle valve on and off. When "on," the fuel/air mixture was richened considerably, thus slowing the motor by a couple of thousand rpm.

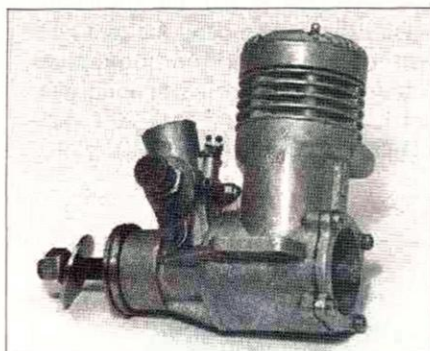
Three years later, Duke abandoned the twin-needle setup for his R/C engines and adopted an exhaust-restrictor type of throttle on all the motors listed in the previous paragraph. The exhaust throttle was far more effective than the double needle, and it permitted a proportional response to throttling rather than merely two fixed speeds.

Three years after *that*, Duke produced the first of his extensive series of barrel-throttle engines. His original carburetor design was exceptionally easy to actuate, because, in 1960, most R/C fliers were still using rubber-band-powered escapements in their models.

Since then, there have been a great many changes in Fox carburetors. Those in Duke's present line-up of R/C engines are as good as any on the market today; in fact, the overall quality of Fox engines



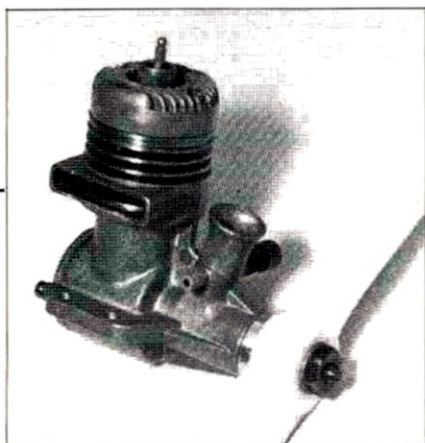
In addition to the conventional prop drive setup, the modern Fox 45BB comes complete with a heavy-duty spinner and backplate, as shown.



An early barrel-throttle R/C Fox, this 36X ran well, but never became popular.

has been constantly improved because of Duke's continuous contact with model fliers from all over the world. When problems do arise with any of his products, Duke quickly resolves them.

For example, in some early Fox A.B.C. engines, pistons tended to stick in their cylinder sleeves after running a little. Instead of freeing up during break-in, they tightened. Duke discovered that it was necessary to "stabilize" the blank pistons before their final grind by subjecting them to several cycles of heating and cooling. This has been a standard practice for cast-iron machine parts for many years, but it isn't usually necessary for aluminum. Even after 39 years in model engine manufacturing, Duke Fox is still learning new tricks!



Typical of early Fox engines, this is a 1958 .15, and a very potent performer.

I'm still learning new tricks with Fox engines, too, even though I've been using them since Duke began making them. For instance, I have a well-run-in Fox 35 in an old-time profile U-control stunt model that I recently restored to flying condition. When I first took this airplane out, its motor started very easily, but died after only a few seconds; it did this repeatedly.

No matter where the needle was set, I couldn't cure the problem. I checked the needle-valve assembly, fuel line and tank; they were fine. I changed the plug, then tried a different fuel; no difference. The engine's gaskets were OK and all the screws were tight, but I still couldn't get the 35 to run more than 10 seconds or so in my airplane.

Eventually, I solved the mystery; the culprit was the spinner! The airplane is an old-timer, and since I still have a few antique Merco spinners left from the '50s, I had installed one in the Fox. That was my mistake! The spinner is big, and the Fox's venturi is so short that it was "masked" by the spinner. Worse still; instead of a solid disc backplate, Merco spinners have an open back, with only a narrow crossbar mounted behind the prop for attachment of the spinner.

After starting, the 35 wouldn't keep running because its spinner acted like a centrifugal blower. It whirled air away from the venturi inlet, and the poor Fox simply died from lack of breath. Without the spinner, the motor performs flawlessly, but the airplane needs that spinner to look right. My only way out of this impasse is to substitute an engine with a much longer intake; one that extends outside the spinner. (I'll use the Fox again later, in another airplane.)

Typical of the latest Fox R/C engines is the 45BB. The newest version has been beefed up with a 1/4-inch crankpin, a 7/32-inch tubular wristpin, a strengthened rod and a redesigned aluminum piston. These modifications permit long, reliable life at high rpm. I prefer big, slower-turning

propellers for my R/C models; they deliver more thrust and produce less noise. However, many modelers like the sound of a very high-revving 2-cycle engine, and the Fox 45BB is an excellent choice for these. However, I'll continue running mine on 12-6s.

Duke Fox agrees with what I've been saying all along in this column: Castor oil is the very best lubricant for 2-cycle engines. Duke still manufactures glow fuel—all castor-oil lubricated. It isn't advertised much, so here's the line-up of Fox glow fuels:

- Gold Star (5 percent nitro)
- Duke's Fuel (10 percent nitro)
- Missile Mist (25 percent nitro)
- 4-Cycle Special (5 percent nitro)
- Fox Superfuel (5 percent nitro; 28 percent oil)

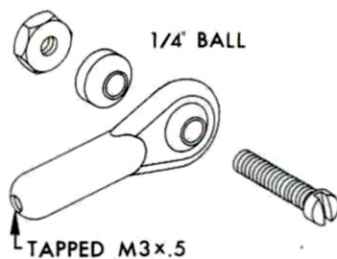
Duke also manufactures one of the very best glow plugs on the market. Originally designed for 4-cycle engines, the Fox Miracle Plug turned out to be ideal for many 2-cycle motors. I like it for cold-weather flying, as it holds heat extremely well. Even with air temperatures below freezing, there's no drop-off in rpm after removing the glow-plug battery. The Miracle Plug also performs just as well in the summertime—maybe that's the reason for its name!

Modelers have increasingly been switching to American-made model motors, and sales of Fox engines have tripled in the last few months. The devaluation of the dollar may be partly responsible for this, but the performance of Duke Fox's motors is surely a major factor in their increasing popularity.

**Here is the address of the company featured in this article:*

Fox Manufacturing, 5305 Towson Ave., Fort Smith, AR 72901. ■

ROCKET CITY R/C SPECIALTIES NEW



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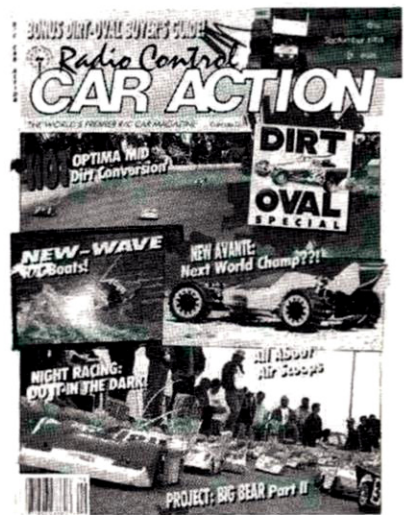
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1/8 AIR FORCE

(Continued from page 84)

Twister, was flown by Jim Morrow. This is a fast, smooth flier made even more realistic by the sound of the 2-cylinder opposed 4-stroke engine Jim had under the cowl. He also flew the large deHavilland Moth that he's been flying for years.

After an absence of four or five years, Bruce Schamber reappeared all the way from Naples, FL, just to see old friends, watch the flying and kick tires. The last time he flew here, he astounded the ducted-fan fraternity by staging a spectacular show with a Byron MIG-15 and the then-new Rossi 81. The performance far exceeded anything that had previously been seen with a ducted fan, and it would even compare favorably with most of today's high-performance jets. Amazingly, that was Bruce's first ducted fan.

The Champlin Fighter Museum in Mesa, AZ, was a most appropriate location for the Fly-In banquet. There we were, eating top-quality steaks, surrounded by full-scale, working replicas of many of the fighters of World War II. After dinner, many of us toured the museum, which also has a fine collection of World War II fighters.

At 3 p.m. on Sunday afternoon the Fly-In was officially over, and the winners of two special categories were announced. In each category, the winners are chosen by one "phantom" judge who isn't a member of the 1/8 Air Force.

Thus ended another fun-filled flying scale get-together where 113 pilots from all corners of the country brought 165

scale planes and flew 155 of them during this three-day meet. The 1/8 Air Force always welcomes all scale models, both civilian and military, from the tiniest up to the largest legal size.

Many thanks are due to the members of the Arizona Model Aviators who graciously allowed the 1/8 Air Force to hold this large-scale Fly-In at its excellent Spook Hills R/C field. And on top of that, many of their members helped to run the events.

Those of you who like this sort of scale should reserve the third weekend in March, 1989. See you at the Fly-In?

**Here are the addresses of the companies mentioned in this article:*

Byron Originals, P.O. Box 279, Ida Grove, IA 51445.

Bob Violett Models, 1373 Citrus Rd., Winter Spring, FL 32708.

RT Associates Corp., 4133 E. 3rd Ave., Hialeah, FL 33013.

Scale Flight Models, 11023 38th Dr. S.E., Everett, WA 98204.

Don Lien Model Products, P.O. Box 70180, Riverside, CA 92513.

Bob Holman Plans, P.O. Box 741, San Bernardino, CA 92402.

Jet Model Products, 304 Silvertop, Raymore, MO 64083. ■

PT-19 TRAINER

(Continued from page 51)

it should be fine. As well as this, the plane is controlled with rudder and elevator, and that's unusual for a low-winger. To be truthful, I was apprehensive!

PERFORMANCE: The proof of the

pudding is in the eating, and the PT-19 turned out to be pretty tasty! As the plane is a low-winger, hand launching isn't recommended, but it does about the nicest ROG takeoff of any 1/2A plane. It tracks right where you put it, and rises so sweetly. Of course, you can't go hauling it off the deck, because this is just an .049 sporty, but you can have a nice time with it up top, easily doing basic maneuvers and spins. It does loops continuously from level flight, but rolls are out of it. Turning with the rudder is slightly different, but effective, and is aided by a generous amount of dihedral in the wing. When the engine runs out of fuel, the plane glides very pleasantly to mother earth, as long as no sudden control inputs are handed out.

The PT-19 is a pleasant alternative for sport pilots, and quite a good step-up trainer from basic flight. I don't recommend it for initial flight training, although given a good instructor, a new pilot will get some very good use from it.

The PT-19 is a superb reminder to me of my early learning days, and it makes for a refreshing change of pace. The Ranger .049 does well and provides more time to enjoy the plane under power than previous .049s did. It's a neat little bird to have around. PT?—Pretty terrific!

**Here is the address of the manufacturer featured in this article:*

Cox Hobbies, Inc., 1525 E. Warner Ave., Santa Ana, CA 92705. ■

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FLOATING AROUND

(Continued from page 82)

runway. I hope this picture convinces you to try float-flying on a "runway" somewhere nearby. There are 3½ million miles of waterways in the United States, and that *doesn't* include lakes, bays, ponds, reservoirs, quarries, deltas and backwaters. Float-flying adds a dimension to modeling that's hard to quit once you've tried it. It might be *the best* that modeling has to offer.

I'm happy to announce that *Model Airplane News* will feature another special float issue next month. We'll have a report on Clearlake's biggest-ever meet, articles on pylon float design and float-plane requirements, as well as something that Rich Uravitch and Chris Chianelli are being very secretive about. Don't miss it!

**Here are the addresses of the companies mentioned in this article:*

Northwest Float Flyer, 909 South 173rd, Spanaway, WA 98387.

Bob Martin, Schneider Trophy Information: (602) 855-6900.

Carl Goldberg Models, Inc., 4734 W. Chicago Ave., Chicago, IL 60651.

Hobby Lobby International, 5614 Franklin Pike Cr., P.O. Box 285, Brentwood, TN 37027.

Balsa U.S.A., P.O. Box 164, Marinette, WI 54143.

John Sullivan Model Floatplane Products, 1421 Second St., Calistoga, CA 94515. (707) 942-5095.

GOLDEN AGE

(Continued from page 97)

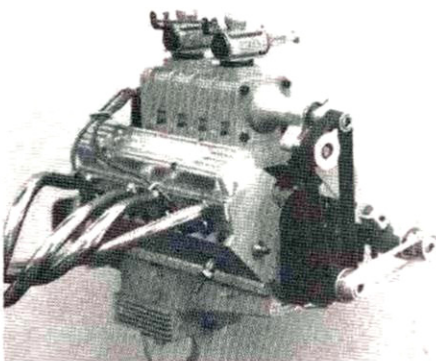
Andy 30 years ago, and he spent time developing a most appealing flying boat. He was very successful, too, as Bill Winter admired it, and a construction article was published in the October '57 issue of *MAN*. As the pictures and drawings show, its design belies its age. In fact, you'd have to prove its early origin at most water fests today, as there has been little change in this classic design.

In 1957, Andy's "boat" was powered with a Torp. .29, and used a single-channel radio-operating compound escapement for rudder, elevator and engine control. As any OTer will tell you, that was a handful to fly, and Andy's success is admirable. Andy recently refurbished the model, installing an O.S. .35 engine and a full cowl. Using a modern radio, he was able to add ailerons, so improving control. The resulting performance matches the best that could be expected today, and he's flying a *genuine* OT R/C plane! Andy says that modern equipment *does* make a difference. This

(Continued on page 110)

Conley V-8—Smallest V-8 Production Engine

The Conley "362" is the world's smallest production model V-8, and is now available in a rough casting kit. With the use of a Bridgeport Milling Machine and a lathe you will be able to machine the kit-provided material into a working V-8. Items included in the kit: castings (block, valve covers, pan heads, and intake), piston rings, water pump, timing belts and pulleys, camshaft lobes, injection-molded parts, wristpins, crank pins, 95% of the required metal, valve springs, screws, taper pins, dowel pins, Loctite, O-rings, and blueprints. The engine has a bore of .750 and a stroke of .625



which gives a total displacement of 36.2 cc or 2.2 ci and weighs approximately 5 lbs. It measures approximately 6" long, 4" wide, and 7½" to the top of the carbs (when optional supercharger housing is used). There is an operating rpm from 2,000 to 12,000. Perfect for ¼-scale cars and boats.

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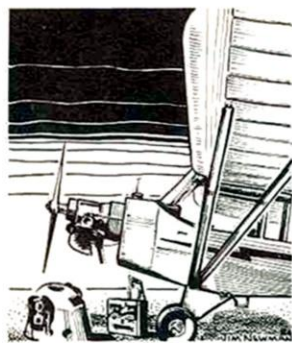


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Giant Steps

by DICK PHILLIPS

AS YOU MIGHT GUESS, I get a good deal of mail from readers, and I try to answer every letter. In addition, I often hear from the manufacturers and suppliers of the goodies we use in the hobby. I recently received a brochure that contained news of some good things you might not have noticed in ads.

The brochure is from Jomar Products*, which makes electronic goodies for electric fans. (Pun intended!) Several items are of interest to those of us who build *big*. Joe Utasi, who is Jomar, makes a 6-channel Glitch Buster that's designed to eliminate noise in the airborne section of your radio/servo combination. In the brochure, Joe offers some good advice to eliminate problems, and he offers the Glitch Buster as the last resort to get rid of interference problems if all else fails. It's worth asking for his brochure, as he has many other good ideas.

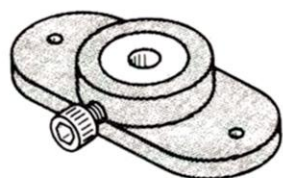
Joe's twin-engine sync system is well-known, and it's used by a number of renowned modelers. It takes a little work to install it, but once in place, it will keep two engines perfectly synchronized. Joe uses it on his Cessna 310, and it really works well.

Joe's newest item (one I hadn't seen) is a 4-cell battery (back-up) system. The unit operates off a model's main battery pack, and if the main battery has a problem, it switches to the back-up battery. This switch-over takes place automatically and it lights an LED to show that the changeover has been made. The unit is all solid state and uses MOSFET transistors. I've also used the Ace, which does a good job but requires the use of 5-cell packs, and the RAModels unit, which uses a mechanical relay. So, if you mistrust the relay idea, or don't want to change all your airborne battery packs, there's now an alternative. Joe says he's seen one rigged to trigger a strobe on the belly of a model, and this operates when the unit switches batteries. Now *there's* a great warning of trouble brewing!

Anyway, if any of this is of interest to you, drop Joe Utasi a line (enclose a

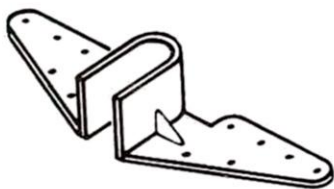
business-size SASE) to ask for a copy of his latest brochure. (His address is at the end of this article.)

For those of you who are builders of *big* models and also World War I buffs, there's good news. Dennis Bryant*, one of England's foremost designers, now has a 1/4-scale SE5a on the market. The span of this classic World War I fighter/scout is 78 1/2 inches upper wing and 75 inches lower wing. Fuselage length is 55 inches, and wing area is 2,182.5 square inches.



Above: Sig's new wheel-pant fastener uses unique wheel collar.

Below: Also from Sig is this heavy-duty rudder horn that's shaped to fit over 1/4-inch stock.



(These measurements are approximate, but very close.) No weight is given, but the construction indicates that it's probably not overly heavy. The recommended engine size is 15cc to 20cc, and the engine shown on the plan is an O.S. 120. There's plenty of room in the engine house, and I think you could crowd a Q40 in there, if you felt the need of that much extra power. It's an ideal candidate for almost any of the larger glow four-strokers.

The set consists of four well-executed plan sheets and a 10-page construction guide. If you've seen any of Dennis' previous work, you won't be disappointed

with this excellent plan. Dennis has a great deal of design experience, and he has well over 20 plans on the market—all of them scale models. These models range from the World War I SE5a to a World War II Spitfire and Typhoon. (Most are at 1/8 scale.) For ease of transportation, the SE5a fuselage is built in two pieces, but it may also be constructed in one piece, if you prefer. Some documentation source material is also included on the plan sheets.

Over the years, I've seen a lot of large-scale plans, and a few have encouraged me to build a model. This one from Dennis begs to be built! Full details are provided to permit building a museum scale model from this plan. The cost is about \$30 (15 English pounds), and Dennis suggests adding 30 percent of that for air-mail shipping. (In most countries, one can obtain an International Postal Money Order made out in pounds and pence. Obviously, 30 percent of the cost is another \$10 to cover the cost of air-mail shipping. Only air-mail shipping ensures that items arrive in a decent condition.)

If you're a World War I airplane enthusiast, you'll think this beautiful SE5a is a "must-have" item. I bet it would attract a good deal of very favorable attention on the scale contest circuit. Dennis has done a great job on a difficult subject.

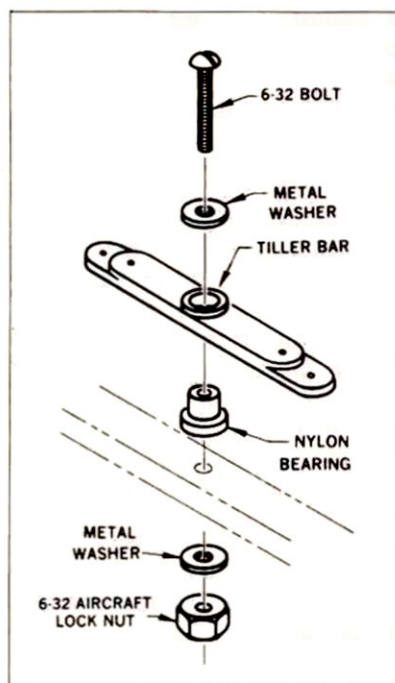
While the model from the plan hasn't yet been flown, I have confidence in Dennis' experience with model design, but with other designs, I'd still be worrying! Dennis has done this sort of thing many times in the past, and his known expertise inspires me to accept the SE5a as having great potential. This plan is a *winner*! However, it's *not* for beginners, as it requires considerable experience and dedication to do it justice.

There's news of lots of new goodies in the mail these days: Sig Manufacturing* is getting more and more into the area of large models, and there are new items in its massive catalog.

Have you ever tried to find a way to



Beautiful 1/4-scale SE5A, now kitted by Dennis Bryant, one of Britain's very best.



Sig's heavy-duty tiller bar. This complete package will make a quarter-scaler's task a little simpler.

keep wheel pants in place? If you fly off grass (and most of us do), you'll know how difficult it is to keep those wheel pants fastened and properly positioned. Sig has a neat little item I hadn't seen before. It's a flat oval of black plastic with a wheel collar embedded in it. The mount fits over the landing-gear wire (my samples fit 3/16-inch and 1/4-inch wire) and are secured with a socket-head screw. The socket-head is a nice touch, and it's usually easier to tighten than a slotted screw. Four small screws inconspicuously fasten the pant to the mount. They are meant to be hidden inside the pant, so they should be all-but invisible when they're in place. This is a useful accessory, and I haven't seen a commercial product like it until now.

The second item is a rudder horn—also made of black plastic. This is shaped to fit over 1/4-inch-thick material and is just a tad under 2 3/4 inches wide. It's a sturdy item that's drilled with six attachment holes providing an array of throws. Four of these are along the rear of the horn and would be ideal for attaching tail-wheel steering connections.

The third accessory is a heavy-duty tiller (steering) bar. Careful thought has obviously been given to its design, as it's swung on a nylon bushing. This allows easy mounting while still permitting free

movement of the tiller bar. Metal washers, a mounting bolt and a locking nut are also provided, so it's a complete package. Four attachment holes are provided, and there's plenty of room for more if needed.

Next, a tip for those of you who fly in cold temperatures: Be careful about plastic items, especially servo arms. Some time ago, I told you that servo arms made of black plastic are often manufactured from "re-ground" nylon. This material is liable to fracture when it gets cold. There may be black arms that don't have this problem, and you can check yours by putting them in the freezer for about 15 minutes. When they're cold, try to flex them. If they show signs of flexing, they're OK; if they don't, they'll break easily. If this happens, think yourself lucky it happened when you were checking them and *not* when they were airborne! I've never seen this happen to *white* nylon arms, but if you fly in cold weather, it won't hurt to check your servo arms.

A couple of quick items to close this month's column: That soft scraping sound you might hear is me wiping the egg off my face. A while back, I said that warm, dry, air is less dense than cool, damp air. This isn't true, and I was laboring under a delusion. This mistake was brought to my attention by a considerable number of more knowledgeable modelers. My thanks to them all for making the correction. (There's not enough room to mention them all!)

Finally, if anyone can put me in touch with Mark Wasserman, who designed a plan for a Piper PA-36 some time ago, and once lived in Delton, MI, I'd appreciate it.

I'm out of space again; hope to see you next month.

**Here are the addresses of the companies mentioned in this article:*

Jomar Products, 2028 Knightsbridge Dr., Cincinnati, OH 45244.

Dennis Bryant, 21 Manor Close, Burgess Hill, W. Sussex, England RH15 0NN.

Sig Manufacturing, 401 S. Front St., Montezuma, IA 50171. ■

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GOLDEN AGE

(Continued from page 107)

time, test flights went very smoothly; on the first water outing, six flights were made, and there was no need for the emergency boat as the model taxied back flawlessly.

At the field, he attempted some grass takeoffs. On slippery grass, many flying boats will often slide well enough to get off, but not this one! Andy resorted to an old control-line trick that was widely used in early C/L days. He made a "drop-off" gear, and this, he says, neatly solved the landing and takeoff problem. Of special interest is that Andy was able to use a modern aluminum gear for this; our original C/L drop-off gears were made of music wire and had prongs that fit into fuselage sockets.

Robert L. Cobb of Barstow, CA, wrote to tell us of early flying in Cincinnati, OH. Bob retired to California, so he now enjoys all-year flying. He writes of early flying with a Midwest Tri-Squire, using single channel with Dmeco Multi-Servos and Rand Galloping Ghost actuators. Now his sons fly R/C, too, and they find his R/C "war stories" hard to believe!

He makes one other point, and it's based on a friend's experience. Orville Hundemer built a Live Wire Pursuit, and it crashed on its test flight because of control flutter. While flutter is seldom seen today, it was a common malady that R/C had to outgrow. We had to learn about tight hinges (early ones were sewn on with thread!), non-vibrating pushrods, tight clevises, etc.—all good things that we now take for granted.

I do have a tip (cure?) for flutter, and it comes from our early experiences. Flutter is caused by the natural resonance of the surface being in sync with the resonance of the vibrating engine and/or flight forces. The solution may be simple: Change the surface's natural resonance so that it's out of the vibration range. I did this by adding some weight to the surface trailing edge.

I hope that my subjects this month have given you a brief insight into the OT action that many are enjoying. Back to history, and more "doings" next time.

*You can write to Enterprises Lehnberg at 2646 Bolker Dr., Port Hueneme, CA 93041. ■

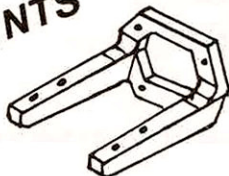
QUIET FLIGHT

(Continued from page 99)

happened to have a Leisure unit in my flight box, so that's what I use.

"PREPARATION FOR USE: The motor is supplied with short leads but no plug. I replaced the leads with Jomar 16-

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.40 RV Pylon	7.75
60 Pattern	10.25

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gauge wire and used a 4-pin Deans plug, as I do in all my small systems.

"The supplied instruction sheet suggests oiling the bearings lightly and breaking-in the motor for optimum performance. The suggested break-in is 10 hours at 3V. I used a 3-cell sub-C pack, which ran the motor for about an hour with no load. In this case, I suggest using Ni-Cds, so that the motor has a chance to cool while the battery is being recharged. This is preferable to hooking it up to a train transformer for 10 straight hours and overheating it. After the suggested break-in period, the brushes were well seated.

"PERFORMANCE: I haven't flown the AP-29 yet, but bench tests using five 800mAh cells (the pack supplied with my Cobalt 035 system) show a performance that's squarely between the Cobalt 020 and the 035, at surprisingly low current drains. Having tested a Cobalt 020 and an AP-29, it looks as though the AP-29 is more efficient than the Cobalt 020—at least under some conditions.

"My AP-29 turns a Graupner 6x4 at about 12600rpm on five 800s, with a current draw of 13.5 amps. My Cobalt 020 turns the same prop at 11200rpm on four 800s, at 17 amps. So the AP-29 gives 1400rpm more to the same prop with virtually the same power input (67.5W or 13.5x5 versus 68W or 17x4). Note that these figures are for a direct connection between the battery and the motor with just one set of four-pin Deans and about 7 inches of 16-gauge wire and no switches or throttles. The effective power-to-weight ratio is slightly less, since the AP-29 and five 800s weigh about an ounce more than a Cobalt 020 and four 800s.

"Other bench performance numbers look like this:

7x3.5 Cox—12400rpm at 13.5 amps

6x4 Cox—11300rpm at 14.5 amps

7x4 Graupner—9300rpm at 17 amps

"All these figures are for the same 5-cell 800mAh pack without a switch harness. Also, the rpm numbers are without the ammeter in the circuit; I've typically found that my ammeter costs about 600rpm.

"SUMMARY: This is a very promising motor, which shows what can be done with a well-designed ferrite motor. It fills a gap in today's marketplace, at least for those of us who like small planes, and would like them to be cheap, too."

This is one of the best motor reviews I've read, and it gives us a complete picture of the performance we can expect

(Continued on page 114)

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- FURTHER INFORMATION AND PRICES CAN BE OBTAINED BY CONTACTING US AT THE ABOVE ADDRESS.

QUIET FLIGHT

(Continued from page 111)

from the AP-29. If you edit a newsletter, send me a copy so that I can pass on this kind of information to readers.

Till next month: good thermals and a full charge!

*Here are the addresses of the companies mentioned in this article:

Sonic Tronics, 7865 Mill Rd., Elkins Park, PA 19117.

Hobby Lobby International, 5614 Franklin

Pike Circle, P.O. Box 285, Brentwood, TN 37027.

Easy Built Models, Box 12, Grimsby, Ontario, Canada L3M 431.

Parma International, Inc., 13927 Progress Pkwy., North Royalton, OH 44133.

Futaba Corporation of America, 555 W. Victoria St., Compton, CA 90220.

Kyosho; distributed by Great Planes Model Distributor, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820. ■

PATTERN MATTERS

(Continued from page 91)

A touch of thread-locking compound here would keep things tight. And that's it! The engine is now completely isolated from the airframe and, just like magic, the sound level from the plane is lowered by another 3 to 5dB. Yes, the engine shakes just a little at idle, but it's incredibly smooth at high rpm. Not only is the sound level reduced, but this will double the useful life of the airframe, as it will now be subjected to less vibration.

For those of you who are wondering what isolation of the engine has to do with lower sound levels, the link is simple to explain. When the engine passes the vibration directly to the airframe, the ship resonates just like a sound speaker. Wooden airframes tend to dampen the vibration much better than fiberglass airframes. In flight, most of the screaming sound you hear from that fire-breathing monster is actually sound amplified via the fuselage. Vibration is also responsible for the breakdown and weakening of fiberglass fuselages, and for shortening the service life of these ships. Of course, if you're like me, you'll never get around to wearing one out, because it gets slaughtered first!

Now I'm off to the Nationals in Tidewater, VA, and if you're heading there, take my advice:

At last year's Masters Tournament, we learned that Tidewater can be a humid place. Pilots from the drier Sun-Belt states don't usually worry too much about rust. When I lived in Arizona and Nevada, I never bothered to oil the engine after a day's flying. However, in Virginia, you'd better oil up...and liberally! I don't recall how many of us changed our engines due to rust, but I know that a bunch of us did, as the rust didn't take long to form—in fact, before the night was out! So, don't forget the after-run oil; you'll really need it.

Until next time, we're on the pipe and airborne.

*Here are the addresses of the companies mentioned in this article:

Ten Plus Co., 9949 Tabor Place, Santa Fe Springs, CA 90670.

O.S.; distributed by Great Planes Model Distributor, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820.

Airtronics, Inc., 11 Autry, Irvine, CA 92718.

Slimline Manufacturing, P.O. Box 3295, Scottsdale, AZ 85257.

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J-6	1/6 5/16" & 1/32"
J-7	1/7 9/32" & 7/16"
J-8	1/8 1 1/4" & 3/8"
J-9	1/9 7/32" & 5/16"
J-10	1/10 3/16" & 5/16"
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HELI CHALLENGE

(Continued from page 89)

+10 degrees at the top. Well, this just won't work, because what we really need is 0 to +5, 1/2 to +8, and that's all our helicopters can handle.

Let's look at the operation of our servos. The servo rotates from one end to the other, and we attach a wheel to the servo output shaft, which allows us to attach a linkage to the servo wheel. This produces the effect of converting rotary motion to linear motion. To get as close as possible to a truly linear servo output, we attach our linkage to the point that's exactly half the total servo throw, with the servo set at the center, or neutral, position. This center point is half the transmitter's stick travel. When studying the collective-pitch servo, you'll discover that the center point becomes our hover point. Now, if we introduce a technique called *differential*, we can bend the throw of the servo so that it behaves as we want it to. We get differential throw by picking a new point that's not exactly half of the servo throw at the center position. This technique modifies the conversion of rotary motion to linear motion in an exponential fashion. (See Figure 1.)

However, before we do this, we should understand a few of the basic aspects of differential:

- The mid-point is biased by moving it closer to the end point, and this will have the smallest value or sharpest curve. For example: We want the hover point (now +4 degrees) to move closer to the high end (+8 degrees) and to become +5 1/2 degrees. Let's say that our servo rotates from right to left for low-to-high operation. To get the new, higher, mid-point, we'll pick a spot on the servo wheel slightly to the left of center, closer to the high end. (See Figure 2.)

- The greater the amount of differential used, the shorter the total throw of the servo. Let's say you've determined that the distance from the center of the servo output to the point where your pitch curve will be from 0 to +8 degrees is 12mm when you're not using differential. If you do use differential, you'll not only need to move closer to the high end of servo travel, but you'll also need to move away from the center of the servo at about the same percentages. In other words, if you're using 25 percent differential, you'll need to increase total servo throw by approximately 25 percent. (See Figure 3.) This will require some experimentation, but it will give the necessary results.

(Continued on page 124)



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Congratulations to Albert Martz of Berkeley Heights, NJ, for correctly identifying the Polish W.S.K.-M4 Tarpan in our July issue. We must be getting better at stumping our readers, as only three correct answers were received.

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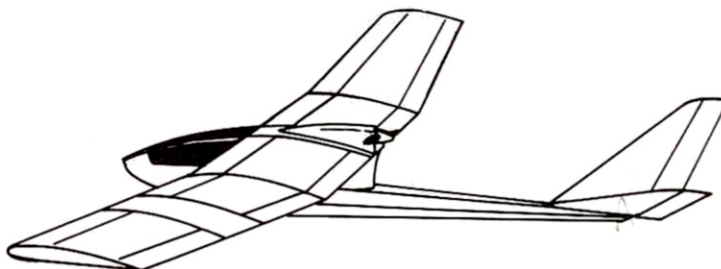


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Club of the Month



The Spring Area Radio-Kontrol Society

THE SPRING AREA Radio-Kontrol Society of Spring, TX, is the *Model Airplane News* "Club of the Month" for September 1988.

The SPARKS club has an impressive membership of 80, and what's even more impressive is that the club has not only model airplane fliers, but also helicopter enthusiasts. We don't know how many helicopter fliers there are in the club, but we do know that in many R/C clubs—and in full-scale aviation—rotary-wing pilots and fixed-wing pilots don't usually get together. It's good to see these machines sharing the same airspace.

SPARKS participates in the usual model airplane club activities e.g., annual picnics, fun flies, monthly meetings, field maintenance (not one of the most popular activities!), etc. Club members receive a monthly newsletter called "Crosswinds." This is edited by Walter Laich and contains a variety of columns telling members about events, new club members and the *lawn-mowing schedule!* One section—"Relations With Neighbors"—explains how someone living near the flying field is concerned because model planes fly over his property. He doesn't mind the airplanes; he's just worried about members who have to retrieve their downed planes from his property. The man keeps a pet bull (not *pit* bull, but the *real thing* with horns and all!) and this could inflict some serious bodily harm if it thought someone didn't belong on its territory. How's *that* for a watchdog!

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Each month *Model Airplane News* will select the club newsletter that best shows the club's activities and energies directed toward the furtherance of the hobby. The award is not based on size or quality of the newsletter, and can be about any aspect of the hobby (F/F, C/L, R/C, boating, cars, etc.). *Model Airplane News* will award two free one-year subscriptions to be given by the club to outstanding junior members. So send your newsletter to *Model Airplane News*, Club of the Month Contest, 251 Danbury Rd., Wilton, CT 06897.

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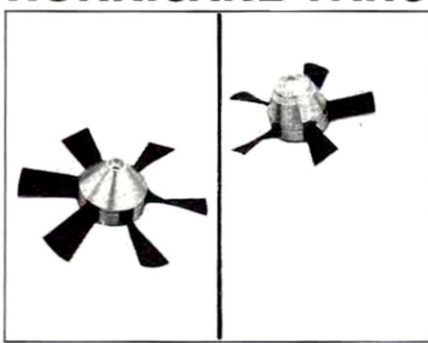
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HELI CHALLENGE

(Continued from page 115)

● When you're trying to set up your pitch curve using differential, it's much easier if your servos have the splined output shafts. This will allow you to remove the servo wheel and move it a notch or two toward the high end, then simply move out to the next hole on the wheel, away from the

output shaft. If your servo has the square type of output shaft, you'll need to use a wheel, and you may have to drill your own hole for linkage hookup.

● When you're setting up the pitch curve using differential, continually check all three points of the curve with your pitch gauge. Start with the midpoint, and be

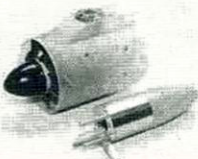
sure that the transmitter collective/throttle stick is in the dead-center position. You'll want the helicopter to hover at the center-stick position, so that you can take advantage of some of the more advanced features of the radio system. Then check both the low and the high ends, and keep adjusting the curve until it's correct.

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Remember that the pitch curve I'm talking about here is just an example: you'll need to know the figures at all three points for your own machine. If you're not sure, don't be afraid to experiment. If you're really unsure about a good starting pitch curve, perhaps a phone call to the kit manufacturer will help.

If your radio system has electronic pitch-curve adjustments, your job is simpler. You may approach the pitch curve in two ways: The easiest way is to set the hover point with the transmitter stick in the midposition, and then use the pitch curve end-point adjustments to set

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the low and high points individually. This method is fine, but if you need quite a lot of differential, it seems that the last parts of stick travel have no effect on the pitch. When you move the collective stick from low to high, the servo moves a little past the center point and then stops, but there's still stick travel that appears to do

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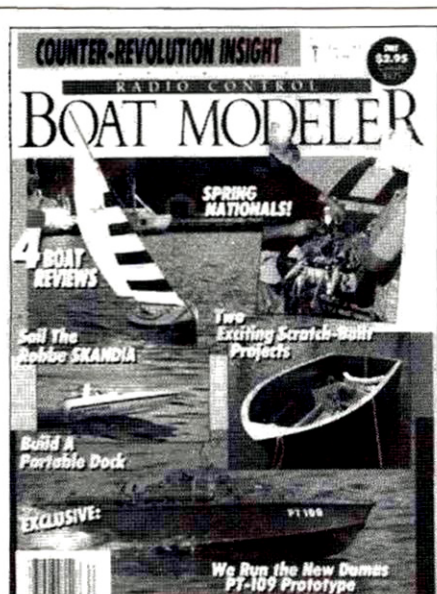
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For further details or information on our special introductory offer, call toll-free 1-800-243-6685 and ask for Katherine Tolliver.

nothing. If you've set up the mechanical servo throw so that you have excessive travel, the low end will also act the same as the high end. What you end up with is a collective-pitch system that's more sensitive around the hover point, and this makes it more difficult to hover smoothly.

(Continued on page 130)



**FOR THE R/C BOAT
ENTHUSIAST
ON NEWSSTANDS
AND IN HOBBY
SHOPS EVERYWHERE**

HELI CHALLENGE

(Continued from page 125)

I don't recommend using more than 10 percent of the available pitch-curve trimmer pots' total travel. Be sure that you start with the pots turned all the way to full servo travel before you attempt to set up your pitch curve.

The other option for using the electronic pitch-curve adjustments is to set up for just a little more servo throw than is usual and to use mechanical differential. This way, you can set your hover point mechanically, and you'll then need only a slight adjustment with the radio to give you a very smooth full-travel collective-pitch system. This will also make our job of setting up for a constant rotor speed much easier, because the throttle will be able to follow the collective more closely.

When you've successfully set up your new pitch curve, go out and fly your machine. Don't settle for less than *perfect* results! You can get the machine to work *the way you want it to*; it will just take time. When you have the pitch curve set where you want it, write your settings down so that you can refer to them later. Measure the distance that the linkage hooks up from the center of the servo output shaft to the servo wheel, and write

that down, too. This will give you something to refer to if you decide to start experimenting with your setup.

Last month, I gave you a chart that explained the effects of different throttle/collective conditions. This month, I've discussed the details of mechanical differential throw, and next month, I'll tell you how to use more differential techniques on the throttle, and so take us closer to the finely tuned helicopter I keep talking about.

Until then, keep working on that ideal pitch curve, and try to grasp the effects of differential throw; we'll be using it quite a lot. ■



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